East Engin. Library

GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CLXVII. No. 3199.] LONDON, SEPTEMBER 3, 1924. [76TH YEAR. PRICE 1s.

OXIDE OF IRON
SPENT OXIDE

GAS PURIFICATION AND CHEMICAL CO., Ltd.
PALMERSTON HOUSE, LONDON, E.C.2.
Telegrams: "PURIFICATION, LONDON."
Telephone: 9144 LONDON WALL.

PUMPING ENGINES
All Types for ACID, &c.
CAST-IRON OR STEEL TANKS
Any Capacity.
CHEMICAL PLANT.
Roofs and Girders. Structural Work.
SULPHATE OF AMMONIA PLANT
Air and Gas Compressors.
MIXERS.
TAR STILLS AND CONDENSERS.
W. NEILL & SON, LD.
Engineers, Iron & Brass Founders,
ST. HELENS JUNCTION.
Telegrams: 'NEILL, ST. HELENS.' Telephone No. 20.

Stand A 44. Chemical Section.
Sulphuric Acid
made from Spent Oxide, for
Sulphate Making
Telephone Ave. 0362. Ask Berk. Telegrams. Berk, London
F.W. BERK & CO. LTD
1 FENCHURCH AVENUE LONDON E.C.3
WORKS AT STRATFORD, E. & MORRISTON GLAM.

"TORBAY PAINT"
FOR ALL PURPOSES.
The TORBAY PAINT CO.,
26/28, Billiter St., LONDON, E.C.
51, Old Hall St., LIVERPOOL.

"BLUEBELL"
SILICA RETORTS
(95% SILICA)
John G. Stein & Co., Ltd.,
Castlecary, SCOTLAND.

Telephones: 8965 VICTORIA. 8967 Do.
Telegrams: "GASIFICATION, Sowest, LONDON."
WALTER MOORE & SONS,
GAS COAL & COKE CONTRACTORS,
72, VICTORIA STREET,
LONDON, S.W. 1.

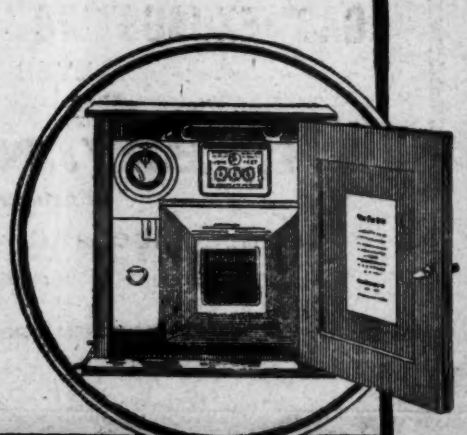
W. & B. COWAN
(Incorporated in Parkinson and W. & B. Cowan, Ltd.),
LONDON. MANCHESTER. EDINBURGH. GLASGOW.
SYDNEY. MELBOURNE. BRISBANE. WELLINGTON, N.Z.
(See Advertisement on p. III. of Wrapper.)

JAMES McKELVIE & CO.
Coal Owners,
Gas and Steam Coal Contractors,
17, RUTLAND SQUARE, EDINBURGH.
59, MARK LANE, LONDON, E.C.
GUILDHALL CHAMBERS, SANDHILL, NEWCASTLE-ON-TYNE.
24, CHAPEL STREET, LIVERPOOL.
ESTABLISHED 1849.

STEWARTS AND LLOYDS, LIMITED, 41, OSWALD STREET, GLASGOW. BROAD STREET CHAMBERS, BIRMINGHAM.
TUBES & FITTINGS for Gas, Steam, Water, &c.

Developing New Business with Hotels.

OUR pamphlet "HOSPITALITY" tells of schemes for equipping Hotels, Boarding Houses, &c., with Gas Fires, each with a
"RANELAGH" HOTEL METER.
This pamphlet reveals a new source of profit which will instantly appeal to all proprietors of Hotels, &c. Send for copies of this interesting circular, which will develop new business in your district.



GEORGE GLOVER & CO., LTD.
Dry Meter Manufacturers and Repairers.
Ranelagh Works, Royal Avenue, Chelsea, London, S.W.3.
Branches: Ranelagh Meter Works, East Park View, LEEDS;
74, Diamond Street, CARDIFF;
City Meter Works, Port Street, MANCHESTER.

Costs by using TENNYSON ELASTIC PAINT twice as long as other Paints. BERMONDSEY, LONDON, S.E. 16.

BUILDERS for INDUSTRY

Many giant structures in Steel have been produced by The Horseley Company to house industrial plant of various kinds. Our resources for the production and erection of Steel Framed Buildings, Roofs, Bridges and Tanks are unrivalled.

We are able to quote lowest prices consistent with sound workmanship, and to give and comply with definite delivery dates.

Ask us to quote for
CONSTRUCTIONAL WORK
of every description.

This large roof span (weight 4,000 tons) over the Purifier House of the Beckton Gas-Works was constructed and erected by the Horseley Company.

HORSELEY

BRIDGE & ENGINEERING Co LTD
TIPTON · STAFFS · ENG·

The firm with a hundred years experience to rely upon. ~ ~ ~

LONDON OFFICE: 11 Victoria St., S.W.1.

RATEAU TURBO GAS EXHAUSTERS

ALSO FOR

PRESSURE RAISING AND COMPRESSING.

Manufacturers under Licence from Professor Rateau.

WE HAVE SUPPLIED AND HAVE ON ORDER **169** MACHINES

Of a Total Capacity of **79,794,166** cubic feet per hour.

MAKERS ALSO OF

VALVES of all Sizes & Types (Air & Gas) and for High or Low Pressures. **DISTRICT & SERVICE GOVERNORS.**

HIGH PRESSURE GAS PLANTS.

GAS EXHAUSTING PLANTS TO SUIT ALL CONDITIONS.

VALVES for COKE OVENS a Specialty.

THE BRYAN DONKIN Co., LTD.,

Engineers and Ironfounders,

Head Office and Works, CHESTERFIELD.

London Office: 3, VICTORIA STREET, WESTMINSTER, S.W. 1.

MEMBERS OF BRITISH FURNACES Ld
MAKERS OF GAS FURNACES FOR ALL INDUSTRIAL PURPOSES

GAS JOURNAL

LIGHT · HEAT · POWER · BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

PROPRIETORS: WALTER KING, LIMITED — OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

Telephone: Central 6055. — Telegrams: "GASKING, FLEET, LONDON."

VOL. CLXVII., No. 3199.] WEDNESDAY, SEPTEMBER 3, 1924. [76TH YEAR.

EDITORIAL NOTES.

Councillors and Contracts.

NOTORIETY throughout municipal circles and, in fact, the country, has come to Mr. Alderman Braithwaite, of Leeds, owing to the recent judgment of Mr. Justice Bailhache, in which the Alderman was the central figure and unwitting culprit. Mr. Braithwaite is the Managing Director of a firm who have a contract with the Corporation; and in view of this, an action was brought against him at the instance of a Mr. Lapish (behind whom it is stated is the Municipal Citizens' Movement) on the ground that he was disqualified from acting as an alderman, and was subject to penalties under the Municipal Corporations Act, 1882. A reference to the case was made in our issue of Aug. 6 (p. 505), when it was mentioned that his Lordship held that the defendant was disqualified from acting as an alderman; and a nominal penalty of £10 was imposed, with costs. The decision has caused intense excitement in municipal circles; and provincial papers and reports show that numerous councils throughout the country possess members who are interested in private firms or are concerned in the direction or management of companies who have contracts with the local authorities. The fact is rather striking; and there must be some explanation as to why the terms of the Act have not had greater effect in preventing the issue of contracts to firms or companies, a principal or director of which is a member of the council. It can only be thought that upon the Act a construction has been placed different from the interpretation given to it by Mr. Justice Bailhache. It follows that, assuming the judgment is correct, not only are the sitting aldermen and councillors who come within the terms of the Act legally wrong, but the Councils themselves (advised as they are by legal officials) should not have issued contracts to firms or companies with principals or administrators serving as members of the Council. This fact seems to indicate that there has been a general unconsciousness of wrong-doing; and, despite the judgment of Mr. Justice Bailhache, the view that what has been done is not wrong still persists, and so much so that it is believed that Mr. Alderman Braithwaite will appeal. Throughout municipal circles it is devoutly hoped the matter will be carried further. If it is, and there is confirmation of the judgment, then there will be a plethora of resignations from county councils and the councils of county and municipal boroughs, or a relinquishing of contracts, though this would not exonerate those who have wittingly or otherwise been indulging in the wrong-doing.

But, looking back, one cannot refrain from wondering whether there has been the degree of unconsciousness of the law (assuming the judgment stands) that is represented. If there has been, it is passing strange that so frequently, when it has been proposed to transfer the street lighting from gas to electricity (the electricity concern being the possession of the local authority and not the gas undertaking), the ruling has been that directors and even shareholders of the local gas company who were members of the local authority were precluded from voting. Many contracts with electricity departments have been passed by that means. The law was conveniently known on such occasions, and perhaps there was a little over-interpretation of its meaning. The point arises as to whether directors of gas companies with contracts for gas, coke, or tar running with a local authority will—under the new ruling, if sustained—be denied membership of the authority. The Act of 1882, it is held, disqualifies from being a councillor a person who has any interest or share in any contract with the council; but there is an exemption. A person is not disqualified by reason only of his having a share or interest in any company incorporated under the Companies' Acts—in other words, a person in the position of a director is disqualified, but not a shareholder. The members of a private firm are in the position of directors of a company. So far as a Metropolitan borough is concerned, the position is controlled by the Local Government Act of 1894; and the legal interpretation is that, under this Act, in the Metropolitan boroughs, a councillor is not disqualified so long as he does not vote at a meeting where a question in which his company are concerned is under consideration. That is the stated legal position; and, so far as the 1882 Act goes, it is supported by the judgment of Mr. Justice Bailhache, which it is hoped by many will be overridden on appeal. It is singular that the question has not before this been adjudicated upon by the Courts.

The judgment is far-reaching, for there appear to be in most cities and towns men sitting on councils whose firms or companies in the management of which they are concerned, have contracts with the Corporation. It is no use mentioning two or three such cities or towns; to do so would only be to touch the fringe of the total number. However, the law sometimes runs contrary to what is expedient in the public interests. In this particular matter, there are arguments for and against Mr. Justice Bailhache's decision. It is obvious that interest may at times be in conflict with duty—that men, being members of a council, may use their influence to their own interest and to the detriment of other contractors and even of the ratepayers. That would be corrupt procedure. On the other hand, there are men who would scorn to do anything of the kind, but would take their chance fairly and squarely with other tenderers. Then, on the other hand, we are afraid that, if the judgment is upheld, there will be numbers of business men who will resign their voluntary work as members of local governing bodies. It is such men whose services are highly beneficial on such authorities; and we could not afford to lose them and so make way perhaps for men of inferior qualification and less efficient. To have to part with them from our local councils would be a serious blow to local government and to the ratepayers. Moreover, there are cases where contracts have been entered into with companies with directors on the councils concerned, because in fair competition they have submitted the lowest tender. To abrogate those contracts, and accept the next lowest tender with no impediment attached to it, would mean a loss of money to the ratepayers. The matter is full of difficulty. But the law cannot give way to expediency. Whatever is the correct interpretation of the law must stand. If it is found on balance that the law in this respect assails good local administration, then the law should be amended. It may be that on appeal the recent judgment will not be upheld. There are many who hope it will not be; and there are also many who hope it will. The diversity of opinion and desire in the matter is an evidence of a widespread view that voluntary service in local government and self-interest are not unattached; but we must disassociate ourselves from that. There is ample personal and general knowledge to the contrary; and for the sake of a good constitution in local government, we hope (if the appeal in the Braithwaite case is unsuccessful) that the law will be altered so as only to deprive men in directorial or managerial positions from voting on matters in which they are directly concerned financially in their private businesses. In other words, let the interpretation of the governing section of the 1894 Local Government Act be applied generally.

Clogs in the Wheel—The Coal Problem.

THE Labour-Socialist Government are being considerably harassed and embarrassed by their own friends; and through the objections of the latter, they stand a good chance of forfeiting their confidence and losing them. Since the advent of this Government, there have been healthy signs, on the part of operatives, of a jealousy of the interests of the industries which give them employment. During the last few months, this has been seen time and again; and, scanning the industrial horizon, we should not be at all surprised if the workers in the gas industry do not soon seek a heart-to-heart talk with their representatives in Parliament over the proposals of the Government to spend national money upon the electricity industry, instead of leaving that industry to find capital for its own development. But, speaking generally, the policy of the Government appears to have been to expose as much as possible, notwithstanding the extent of unemployment, our people to competition from abroad, particularly from those countries with greatly depreciated currencies, lower wages, and a standard of living against which the workers of this country would strongly rebel. The Government commenced their career in this direction by lowering from 26 to 5 p.ct. the reparation duty which the Germans had to pay on goods exported to this country. The generous easement thus provided accelerated the flow into this country of goods cheaply manufactured by the workers in other countries. Later the folly of the step was recognized by the Government. But they were not content. The immolation of Part II. of the Safeguarding of Industries Act and the M'Kenna duties succeeded, showing again a fine generosity on the part of the Government towards the workers of other countries, and an equally magnificent disregard of those engaged in certain industries in this country. That action has not made friends for the Government in the industries affected. Authorities tell us that the treaties with the Bolsheviks are not, from the commercial point of view, going to do this country a pennyworth of good; and such treaties are entered into, while the Empire preference resolutions passed by representative men of the whole Empire (who are not Bolsheviks) are lightly thrown overboard as being of no use to the present Government or to the country and the Empire. It is a queer world. And in this world of ours, socialism is proving its callousness and its costliness—especially for the workers. And the workers are beginning to realize that things are not developing as expected and promised, and that their leaders are as incapable of making a new heaven upon earth for them by their policies as they are of bringing under control the unpleasant atmospherical conditions that have reigned this year during the period commonly called summer time. In the course of the last few weeks, there has been an increase of 70,000 persons in the registrations of unemployed!

There is one section of workers who assert that they are not going to allow the Government to interfere with the economic conditions of their industry; and this looks like the beginning of a new storm, and of fresh embarrassment for the Government. There is rebellion against them in the hearts of the miners; and the Government will not like the appearance of this dissension on the part of the strongest and largest segment in their constitution. The miners have several representatives in the Government; their voting power in the Labour Party is something the Government cannot, and dare not, ignore. Matters are very unsettled in the mining industry. Coal exports have receded alarmingly; and threaten to do so still more. In the chief coal-exporting areas, there are many men unemployed and short time is being worked. They know that France, Germany, and Belgium have been taking considerably less coal. Upon this there comes the London Conference and the acceptance of the Dawes scheme and plans for the payment of reparations. The International Committee of Miners a short time ago unanimously decided to meet their respective Governments, and to urge that no further reparations should be paid in coal. The Miners' Federation are now anxious to hear what Mr. Ramsay Macdonald has to say regarding it. They have pressed him for an interview. He has promised to receive a deputation; but he has not fixed a date for it. From what a prominent representative of the Executive of the Miners' Federation has publicly made known, it seems the miners want to know exactly what are the implications of the Dawes scheme; and he declares the miners are not prepared to allow any political considerations to affect their economic condition, no matter what political party is in power. They are not willing to permit the industry to be further jeopardized by the Dawes scheme; and before taking action they want to hear what the Prime Minister himself has to say. Data are to be collected by the Federation regarding the position of the coal export business, and as to the likely effect of reparations coal on prices and exports. The miners have not hitherto looked sufficiently ahead in formulating their demands, and now foreign competition is cutting the ground from under their feet. The mineowners are also feeling grave anxiety as to the effect on the export business, which has already suffered much from atrophy. There is no question that the Government are not a little perturbed by the attitude of the miners; and the feeling is shared in high quarters in Paris. It is thought there that the British miners do not understand the position—that they do not fully appreciate that for the maximum good it is international peace that is wanted, and not merely consideration for the British coal-mining industry. There is some amount of truth in this; but the British miners have a strong penchant for resisting anything which affects their own interests. The Mining Association, on the other hand, were not consulted or kept informed as to what was taking place respecting reparations coal during the deliberations leading up to the adoption of the Dawes scheme; and the coalowners now seem to think it is rather late to interfere in what has become a political matter pure and simple. However, it is a piquant situation that appears to be developing between the miners and the Government.

Educating the Public in the Fuel Problem.

WE have recently had our World Power Conference at Wembley; and much was then said as to what ought to be done and ought not to be done in respect of our fuel supplies. The most practical part of what transpired is found in the suggestions made for co-ordination in the utilization of fuels. Technical men, however, may talk and entertain the most pious intentions in these matters when in conference; but the fruition of their schemes must largely depend upon the sympathy and support they can get politically and publicly. To educate the politicians and public in these matters is highly important; and therefore we are interested in a series of articles on "Fuel Energy" which has recently appeared in the "Daily Telegraph," contributed by "An Independent Scientist." They are popularly written; some of the data are only approximate; but they are sufficiently near for us not to cavil overmuch respecting inaccuracy. Correction ought perhaps to be made in certain of them; for instance, it might be pointed out that 6,000,000 units of electricity are not equivalent to 200,000,000 therms. A few cyphers too many make a considerable difference in the status and significance of the whole number. Their commending feature is that they are for the most part acceptable in direction, and as an educational effort are useful. Moreover, the articles are written by an "independent" scientist. To be able to treat such a large subject from an "independent" standpoint is highly valuable. There is no bias. As a rule, bias and impassioned statement, when made by an advocate of any particular system, has direct relation to the strength of the case that his own particular interests present—the weaker the case, the greater the display of bias. For instance, the strength of the gas industry in the cooking and heating fields is so well established that there is no need for hyperbole or pretence, both of which frequently cause our electrical rivals to be bowled over in argument, experiment, and practical experience. They are going through the mill now in respect of their claims for electric cooking.

The articles form a survey of the present and future of the fuel industry as affected by scientific progress, politics, and economic laws. The subject is an intricate and highly controversial one; and yet it is seen how neatly it can be treated to meet even mediocre intelligences without offence to those of higher order. Articles of the kind should do a great deal to prevent following blindfold every optimistic "stunt." There have been many spectacular schemes put forward during the last few years in the shape of low-temperature carbonization and electric super-power stations. There is something about them which fascinates those who are unable to explore the potentialities for themselves; but those who are in a position to do so, are usually able to come to a fairly rational conclusion as to their prospects. And we know sufficient to be aware that there is nothing revolutionary about them—in fact, they are more likely to prove re-

actionary, except in very special circumstances. It is important that the public should be taught fundamental facts regarding heat and power production; and then their interest could be carried forward to what is actually done and to possibilities. Very few of the public give heed to the simple fact that—with the exception of those countries favoured with water power, and the comparatively small amount of electrical energy developed from oil—the common services of heat and power are dependent upon coal. Also that, generally speaking, the applications of heat and power must be through the use of crude coal or gas or electricity. Get those facts home, and a good start is made in the educational work. Having got so far, when the public learn that one electrical paper computes that less than 10 p.ct. of the houses using electricity employ it for anything other than light, while the gas industry sells about seven times as much energy to each consumer for lighting, heating, and cooking, the man in the street will have something more to arouse his curiosity, and he will want to know why this is so. His curiosity should be developed. Having secured interest so far, the next step is to show how large is the amount of energy obtained from a ton of coal by the gas process compared with that realized by the electricity process. That is a matter we need not touch upon here; the facts are well known to our readers. But in connection with it, there is a point upon which there should be, in justice to coal, a little correction. The "Independent Scientist" says that, "although only about one-sixth of the coal used in this country goes to gas and electric works combined, the gas and electricity produced naturally represent a much larger percentage of the energy available for the public, since both can be used much more efficiently than raw coal." That is an error, so far as electricity is concerned. Take room heating, for example. We know that coal can be used with about 24 p.ct. efficiency; while the production of electricity at an expenditure of 2·24 lbs. per unit only represents an efficiency of 12·3 p.ct. with coal of a calorific value of 12,500 B.Th.U. Even if used at 100 p.ct. efficiency, that would only be half of the useful efficiency of a coal fire, without counting distribution losses from the electricity system. In other heating operations, the efficiency of electricity is not anything of which to boast. Again, justice is hardly done to gas when it is said to be at least twice as efficient as coal—it is three times more efficient in room heating. These are all matters upon which, in respect of the fuel problem, the public require to be educated, and there are more.

For several years there has been much talk in the electricity industry as to super-power stations, and what they would do. They are not going to work the miracles predicted. But super-power stations are talked about as though they are something new; they are only new to the electricity industry. In the gas industry we have had super-power stations for a great number of years. The "Independent Scientist" calls attention to this, and refers (without naming it) to Beckton. He says:

Not only does this gas station produce more energy than all the electrical industry in Great Britain, not only does it out-class any existing electrical super-power station in the world, but it is remarkable even when compared with the biggest yet projected for the future—at Colfax, U.S.A.—which is only about one-sixth finished, and which will burn some 850,000 tons of coal a year, and use a river as big as the Thames for its cooling water. When that electrical super-power station is some day completed, it will be nearly one fifth as big an energy distributor as this actually working gas station in East London. We may even make a comparison with Niagara itself—where no coal has been burnt and merely the free resources of Nature utilized. It may surprise some to know that the biggest electrical station in the United States, which has Niagara to draw upon, is only about half as big a source of power as is our own gas station, which may fairly be called Niagara-on-Thames.

The reader is also shown that in the most efficient of generating stations nearly nine-tenths of the heat of the coal is used up in the process of producing one-tenth in the shape of energy!

However, we are led on by the "Independent Scientist," and shown that no one method of power and heat can meet every need. It is suggested that what is required is a combination to respond most effectively to both domestic and industrial demands. We should desire to make some reservations in that respect—anyway until we know precisely what is at the back of the writer's mind. It may be admitted that there is ample space in good service for both gas and electricity, and that the process of adjusting their spheres of usefulness is proceeding largely through experiment and experience. The trouble is that there are men in both industries who think their own particular commodity is capable of fulfilling all purposes with the utmost efficiency—not merely thermal efficiency, but service efficiency. That, of course, is a mistake. The writer in the "Telegraph" recognizes that. For power, he tells the public, the rivalry has to be largely decided on the question of costs in each set of circumstances. But the electric motor has conveniences; it can be placed anywhere, and takes up very little room. On the other hand, the repairs and upkeep of a gas-engine are microscopic. With it a bad and expensive breakdown is almost unknown; while a sudden overload may burn out an electric motor altogether. Many industrial establishments, he points out, are also proving hour by hour that it is cheaper for them to generate their own current by gas-engines than to take it from the town cables. As to heating, he expresses himself deliberately. "It cannot be denied "that the use of electricity for ordinary heating purposes is "a scientific atrocity." Concerning cooking, he says "the "question is nearly closed." The gas-cooker has come to stay, and with it the gas-copper. As to lighting, it is doubtful whether it is worth while wiring for this where gas is being used for other purposes.

This is merely an indication of the contents of several columns of material giving the lay reader an insight into this great fuel problem. The examination by an "Independent Scientist" causes him to pass from the facts to policy, which is not so much a question for the public. In this connection, be favours more combination within each industry and between the two industries; and then in the end he arrives at co-ordination. There is the Mines Department of the Board of Trade; there is the Department of Gas Administration; and there are the Electricity Commissioners attached to the Ministry of Transport. There is also the Fuel Board. One great fuel problem involved, but a definite division of administration, responsibility, and procedure.

There is no body anywhere in England responsible for thinking, planning and executing schemes of any kind whatever which concern the fuel industry as a whole; yet there is the greatest need for such co-ordination. There has never been an inquiry into the fuel industry as a whole. There have been Royal Commissions on coal and electricity, and Government inquiries into every aspect of the gas industry, but never any attempt to look on the fuel industry as one.

Thus this enlightener of the public ends up his articles by holding that there must be no more sectional commissions and sectional inquiries. What is needed is some sort of Fuel Board whose advice should be taken in any matter affecting one or more of the three branches of the industry, and which should eventually give us something like an enlarged Electricity Commission, but responsible for the whole development of the country's most vital industry. While agreeing with this up to a point, absolute agreement could only be conceded when the details (if acceptable) of such a body and its functions were available—such as constitution, scope, and measure of authority. From the educational point of view, the articles are highly interesting, and, as previously said, valuable.

The Severn Barrage.

AMONG their employment-making schemes, the Government have resuscitated the Severn barrage project, which was pigeon-holed some four years ago as being a colossal and expensive conception with no real net profit attaching to it. The revival of the scheme will have no effect in causing the present deluge of unemployment to recede; and it is so far removed from our present knowledge of those things that are practicable that a big research is required, at an enormous expense, to say whether or not the scheme is feasible. The only people who will obtain immediate employment are the scientists and professional engineers who are to be engaged in the investigation; and it is hoped that, long before things would be (if ever) sufficiently ripe to begin work on the project, unemployment of those other classes whose needs are great will have greatly decreased. If the plans were all ready, the barrage and the electrical work would give employment to many men; but the best of brains ponder vaguely over the question. Would the scheme when finished give electrical energy at a cheaper price (having regard to the capital cost) than it could be generated for by other well-known and certain means. If it did not do this, the work would not be justified; and the electricity supply industry would find itself with another white elephant harnessed to it. We sometimes in our

views stand hand in hand with "Meteor" of the "Electrical Times;" on other occasions when he gives way to saying foolish things, we unclasp hands, and then there is a little tilt at him. We are to-day in agreement with him when he writes: "We wish that the politicians would leave coal "mining and electricity supply alone for a year or two. "There is a chance of progress and prosperity in the latter "industry; but politics nearly killed it in the early 'eighties, "and forty years later politics may easily paralyze it again." If common sense did not prevail, perhaps, as representing the gas industry, we ought devoutly to wish that politics would paralyze the rival industry.

But we do not; and there is no fear of electricity. We have got a fair measure of its capacity, as we have of that of the gas industry. What we do believe is that if the Government go launching out into all sorts of fantastic schemes and spend heaps of money (the cost of the Severn project was at one time estimated at £20,000,000 to £30,000,000), in the hope of getting electrical energy to flow through the land at impossible prices, so that it can be used for light, heat, and power in the humblest cottage, they will be doing a disservice not only to the nation, but to the electricity industry. They are proposing to take upon their shoulders the standardizing of frequency throughout the industry, and are contemplating helping in the cost of providing transmission lines throughout the country for large generating stations. It will be the capital expenditure that will flow, with all the permanent charges attached. Parliament ought to stop the Government indulging in these expensive excursions into matters of which they know nothing, and leave the developments of the industry to its experts. Whatever happens in connection with the Severn scheme, the whole country cannot be supplied from that source; but the bulk of electrical energy required will have to be supplied still from stations using solid fuel, and showing at most 18 p.ct. efficiency, which means that all heating by electricity will be a sad waste of the country's fuel resources. The Severn scheme may prove to be an expensive way of saving some of this. The Government know nothing of these things. This is proved every time a Minister makes utterance on the subject.

However, regarding the Severn barrage scheme, the Government are going to work to secure advice in quite a proper manner; seeing that it is better to spend thousands on investigations than to dissipate millions on executing work that will not have the desired results. To the Department of Scientific and Industrial Research the investigation has been entrusted; and the Lord President has appointed a Committee to supervise and direct it. Of this Committee, Mr. G. S. Albright is the Chairman; and the other members are: Prof. A. H. Gibson, M.Inst.C.E., Mr. G. W. Lamplugh, F.R.S., Mr. Maurice Wilson, A.M.Inst.C.E., and Dr. J. S. Flett, F.R.S., Director of the Geological Survey and Museum. In a communication from the Department of Scientific and Industrial Research, it is pointed out that the feasibility of the Severn scheme turns first and foremost upon the possibility of finding satisfactory foundations for a barrage. The foundations are highly important; but the cost of the ultimate energy that it is supposed will rejuvenate and develop the country for miles around is the great objective. However, the primary stage of the investigation will involve: (1) The study by the Geological Survey of the stratigraphical formations in the neighbourhood of the sites suggested for the erection of the barrage. (2) Preliminary soundings to determine the contour of the river bed at the sites. (3) Preliminary measurements of the flow of water at different states of the tide. This last is important. When the idea of this barrage was originally introduced, Avonmouth, Newport, Cardiff, and Bristol were solicitous as to the effect upon them of this interference with the natural flow of the river. Apparently the electrical part is to be left for a time, until the preliminary work has been done, which again is very proper, providing the Government, in their anxiety to do something, do not make a start before they are assured by competent men that the barrage will fulfil its destined and distinguished purposes without doing harm to communities with large dependence upon the river. Already to follow up the geological and measuring work, Sir Maurice Fitzmaurice, C.M.G., F.R.S., and Sir John Purser Griffith, M.Inst.C.E., have been invited by the Lord President to submit a joint report before the end of the year as to the possibility of constructing a barrage on one or more of the sites suggested on the assumption that safe foundations exist. At their disposal will be placed the data resulting from the geological and hydrographical investigations. Already the staff of the Geological Survey have begun their part of the inquiry; and it is expected their report will be ready for submission before the end of September. We must therefore wait a while for more interesting developments—one way or the other.

Wembley.

The attendance at the British Empire Exhibition had by last Saturday exceeded the 12,000,000 figure by upwards of 90,000. It is a remarkable score; but such a huge enterprise requires patronage on a magnificent scale to make it pay. It is hardly likely that another 18,000,000 will visit the display during the next two months, though that number would be cordially welcomed by the authorities. There is a suggestion afloat that the closing of the great show shall be Armistice Day—Nov. 11; but no decision has yet been arrived at. Negotiations are still proceeding regarding the continuation of the Exhibition next year; but it appears unlikely that the Dominions will consent—chiefly on the ground of expense.

Rating of Machinery.

The National Gas Council have decided to submit oral evidence before the Rating of Machinery Committee.

Electricity Wages Dispute.

The special tribunal appointed by the Ministry of Labour to consider the difference regarding the new wages application from the trade union side of the Joint Industrial Council for the Electricity Supply Industry held a meeting last week, under the chairmanship of Mr. W. Addington Willis, C.B.E., to consider procedure. This having been determined, it was decided that the next meeting should be on the 10th inst. The demand is for an increase of 10s. per week.

Electricity or Gas for Workmen's Houses.

A writer in the Hastings "Evening Argus" is surprised. His surprise is a direct product of ignorance; and people who are ignorant on practical matters ought not to be allowed space in a local paper to advertise their want of knowledge, and perhaps mislead other people. The writer does well to adopt a *nom de plume* rather than allow his identity to be known to the (in these matters) educated public. He has been visiting the Corporation Eversley Road cottages; and he relates what he found. Among other things he says: "I was surprised not to find wiring for electric light, which costs so little when the houses are being erected, besides being so much healthier for the mothers and children. On the penny or shilling in the slot system this would become a source of revenue to the Corporation, and one collector could call each week for rent and light, and save on the double service. It would also be a good plan for the same collector to ask for the rates say once a month, instead of twice a year."

A Little Information.

We should like to interrogate "Municipal" upon his statements that wiring for electric light costs so little (when properly done), "besides being so much healthier for mothers and children." Of course, he means the lighting, and not the wiring in the latter part of the expression of surprise. Why "mothers and children" and not fathers? A very few questions we think would convict him of a curious absence in his mental equipment of some elementary knowledge. The houses, we know, are fitted-up entirely with gas; the work having been undertaken by the Hastings and St. Leonards Gas Company. The consumers can have fittings on the prepayment or ordinary system. The Clerk of the Works considers the fitting-up to be "too good," which speaks for itself. We believe that in the Corporation first housing scheme the Electricity Department used their position to insist upon electric lighting. Gas was, however, required for cooking, and sometimes for a copper. Being thus restricted as to custom, the Company insisted upon the whole cost of laying-on the gas being defrayed by the Corporation; and this was done. In the later schemes, owing to the action of the Ministry of Health, the Corporation had to decide as to which agent they would have—gas or electricity—and they were com-

pelled to face the fact that gas is the more useful. In the first housing scheme, the residents are of an entirely different character from those anticipated; they are not of the working class. In the new housing scheme, there are very poor people and a good many working folks. To them the prepayment system of gas supply appeals strongly, and answers all their needs. The "Argus" should exercise the blue pencil a little more freely.

Trade Union Centenary.

In 1824, an Act was passed repealing "the laws relative to the combination of workmen, and to fixing the wages of labour." This was the actual starting-point of the organized labour movement; and the completion of a hundred years sees a Labour-Socialist Government in precarious power. No fuss is being made over this centenary.

One Central Authority for London.

The Labour Party have a scheme for the establishment of one central authority for the Government of London, which is certain to evoke widespread adverse criticism, in spite of the fact that it is stated the changes should be "of minimum character, with a view to arousing the least possible opposition." Inasmuch as the proposals include the abolition of the London County Council, the Metropolitan Asylums Board, the Metropolitan Water Board, the Thames Conservancy, and the Middlesex County Council, and the substitution of a central authority, the opposition must obviously be of a widespread and severe character.

Retail Price of Coal.

The price of coal was raised in London last week by 1s. 6d. to 2s. 6d. per ton, according to quality. The gas companies are busy installing gas-fires for the winter season.

A Quarter's Coal Working.

During the June quarter, there was a substantial fall in the production of coal—due partly to a seasonal decline in the house coal trade, to the fact that both the Easter and Whitsun holidays occurred in the quarter, and to the slide in the export trade, as well as to the heavier purchases in the first quarter when there appeared to be the prospect of labour difficulties in the industry. The output of saleable coal during the June quarter was nearly 65,800,000 tons, as compared with 71,000,000 tons in the previous quarter, 69,000,000 tons in the corresponding quarter of 1923, and 73,000,000 tons in that of 1913. The average number of wage earners employed during the quarter was 1,190,300, as compared with 1,185,700 in the quarter ending March last, and 1,156,500 in the quarter ending March, 1923. The estimated output of coal during the first quarter of 1924 was 17·8 cwt. per man-shift worked—about ⅔ cwt. less than in the corresponding quarter of 1923.

Researches of the National Physical Laboratory.

From H.M. Stationery Office we have received a copy of the Collected Researches of the National Physical Laboratory, Vol. XVII., 1922. The contents of this imposing volume, which may be obtained from H.M. Stationery Office, Imperial House, Kingsway, W.C. 2 (price 17s. 6d. net), are comprised of work on such subjects as the refractometry of prisms, immersion refractometry, optical instruments, photometry, &c.; and in all there are thirty-one researches, preceding each of which is a brief abstract. In a paper on the photometry of optical instruments, Mr. J. Guild, A.R.C.Sc., describes the use of a portable surface-brightness photometer of the polarization type for the measurement of the fraction of the incident light transmitted by an optical instrument, and for the measurement of the relative brightness of different parts of the field of view. The instrument employed in the research was a Wanner optical pyrometer. An addition to the instrument is described which removes the danger of error due to polarization of the incident light.

The Use of the Cinematograph for Industrial Processes.—The value of industrial cinematography is becoming more and more recognized, and for some time manufacturers in the Birmingham area have been anxious to apply the cinematograph to their own problems. Hitherto, however, it has proved difficult to provide satisfactory lighting. This led to the matter being taken up by the Industrial Research Laboratory of the Birmingham Gas Department, who have adopted for their work a mercury vapour lamp due to Messrs. Kelvin, Bottomley, and Baird, Ltd., working in conjunction with the Thermal Syndicate, Ltd. This has proved highly satisfactory.

PERSONAL.

It was reported last week to the Lytham St. Annes Council that Mr. E. HARGREAVES had tendered his resignation as Manager of St. Annes Gas-Works, which would take effect on Sept. 30. He requested payment of compensation amounting to £4c90 due to him for loss of office owing to the amalgamation of Lytham and St. Annes. It was resolved that the resignation be accepted, and that the compensation due to Mr. Hargreaves under the terms of the agreement be paid at the termination of his appointment. Tributes were paid to his services, and the hope was expressed that he would enjoy good health during his retirement.

The vacancy created on the Board of the Woking District Gas Company by the resignation through advancing years of the late Mr. Samuel Spencer was filled by the election of Mr. LAWRIE TREWBY, who was subsequently appointed Chairman and Managing Director.

The resignation of Mr. ALEXANDER YUILL (the Gas Manager), on account of advancing years and the state of his health, was intimated to a meeting of the Gas Committee of the Dundee Town Council last week. Mr. Yuill, in his letter, said he left himself entirely in the hands of the Town Council. Mr. J. T. Brown (Convener) expressed the regret of the Council that Mr. Yuill had arrived at the stage when he felt that his health would no longer justify his retaining his position. A Sub-Committee were appointed to deal with the matter.

GAS RESEARCH FELLOWSHIP.

Mr. C. B. Marson has been elected to the Gas Research Fellowship of the Institution of Gas Engineers, which is held in the Department of Coal Gas and Fuel Industries in the University of Leeds for the prosecution of research into gas problems under the supervision of Prof. Cobb. He succeeds Dr. Stuart Pexton, who resigned the Fellowship at the end of May, on being appointed to the research staff of the Gas Light and Coke Company.

Mr. Marson received his school training at the Hull Grammar School, and before coming to the University, in addition to war service, had obtained experience in the laboratories of the British Thomson-Houston Company, Ltd., and of Capt. Foster, F.I.C., of Hull. Last June Mr. Marson was awarded the B Sc. degree with First Class Honours in Fuel and Metallurgy at the University of Leeds, having submitted a thesis on the influence of different furnace atmospheres on the scaling of iron and steel, with an account of experimental work carried out on that subject.

JOINT BENZOLE RESEARCH COMMITTEE.

Appointment of Research Assistant.

Mr. Godfrey Claxton has been appointed Research Assistant to the Joint Benzole Research Committee of the National Benzole Association and the University of Leeds, and will work in the laboratory of the Department of Coal Gas and Fuel Industries in the University, or in suitable industrial establishments, according to the demands of the investigations in progress.

Mr. Claxton was a pupil of the Leeds Boys' Modern School, and twelve months ago became a University Scholar, on graduating as B.Sc. with First Class Honours in the School of Chemistry. Since that time he has been engaged with Prof. Dawson in research upon some problems in connection with the solubility of phenol.

"Cracking" of Natural Gas.—Mr. Harry L. Masser, of the Los Angeles Gas and Electric Corporation, presented a paper at the Southern Section meeting of the Pacific Coast Gas Association, in which he dealt with the reforming or "cracking" of natural gas, a practice adopted by gas companies in California, particularly in Los Angeles and Santa Barbara. This reforming process consists of a breaking-up of the natural gas into a gas whose characteristics are similar to those of manufactured gas. The natural gas is put through regular oil-gas generators and subjected to a temperature of approximately 1800° Fahr.; the result being a product of lower heating value than natural gas, but of largely increased volume.

Sir John Cass Technical Institute.—The 1924-25 session of the Institute (which is situated in Jewry Street, Aldgate, E.C.) will open on Thursday, Sept. 18, and students will be enrolled from 6 to 8.30 p.m. on the three evenings immediately preceding. Evening instruction is given in a large number of subjects, including chemistry. Full facilities are provided in the well-equipped laboratories of the Institute for special investigations and research. The instruction in experimental science also provides systematic courses for the examinations of London University, the City and Guilds of London Institute, and of the Institutes of Physics and Chemistry. Special courses of higher technological instruction form a distinctive feature of the work of the Institute, and among those which the syllabus embraces are technical gas analysis, pyrometry, and fuel.

ELECTRICITY SUPPLY MEMORANDA.

ALL that fine work which was put into the revision of the electrical equipment regulations by the Committee appointed by the Institution of Electrical Engineers appears likely to be much effort wasted, unless there be some means of enforcing them. Many views have already been expressed that the regulations will be more honoured in their breach than in their observance. That will be nothing new in the electricity supply industry. Year after year we get Mr. G. Scott Ram, the Chief Electrical Inspector of Factories, heartily condemning the defective work that he and the other Inspectors find in factories and other manufacturing establishments, as well as in generating stations; and this has been going on under regulations of less refinement than those that are now presented for acceptance by those concerned. What we cannot understand is how the Fire Offices have passed installations that have been found worthy of such strong condemnation. We now wonder whether they, being parties to the new regulations, will exercise greater rigidity in control, and insist upon their observance. The additional refinements which the regulations embody are arousing a good deal of scepticism as to whether those concerned will pay heed to them. The Fire Offices appear to hold the whip hand, and they are the ones most capable of enforcing obedience. The chief criticism of the higher standard now demanded by the regulations is not directed to the greater safety and reliability that they have been constructed to serve, but to the greater cost that would be involved in carrying them out. The cost should be the secondary consideration, but it is elevated to primary place.

Will the Fire Offices Enforce Regulations?

A fair sample of what is thought of the new rules is found in the "Correspondence" columns of the "Electrical Times." The writer is Mr. M. Farrer. His view is that the rules will not be observed in full; and he makes these caustic comments: "What a farce becomes all the talk about cheapening and popularizing the use of electricity when our own profession goes out of its way to make this object more difficult of attainment. I should have liked to have seen the rules entitled 'Model Rules for Electric Wiring,' with a note to the effect that they represent a standard for the highest class practice where cost is only a secondary consideration." Then he makes a suggestion which we should not class in the category of honesty; and it indicates something which might be called deception. He says: "In actual practice in the future, as to a less extent in the past, if a contractor is asked by an architect to tender for a job to be carried out in accordance with the Institution rules, he will either quote a price based on his usual standard of work in the hope that the architect will not discover that the work does not comply with the rules, or he will add a handsome percentage to cover the additional cost of complying with the rules." Obviously the writer thinks deception is likely to be practised, as he remarks: "I am afraid the former procedure will be the one most observed." However that may be, the opinion of the writer is that the rules will certainly have one effect—"they will bring more work to the irresponsible 'one man firm' which neither observes, nor even knows, the wiring rules and quotes accordingly." In other words, what was intended to raise the standard of equipment will operate the other way. "Meteor" in the same paper also thinks that the striving for perfection is a hindrance to progress. He ends a comment with the words: "Unless downright negligence, ignorance, and scamping are in play, electric lighting is so safe as compared with all other illuminants that any elaboration of our wiring methods just now should have the most solicitous regard to the factor of expediency." Electric lighting unfortunately lends itself to negligence; unfortunately, too, the experiences of the fires caused by, and the unreliability of, the electrical system make the well-wishers of the industry seek to reduce those troubles by attaining to more perfect standards, which the short-sighted repudiate.

The Higher Standard and Deception.

Is modern advance in the efficiency of naked electric incandescent lamps actual progress? We put this question because in those lamps higher temperature is involved; the construction of the gasfilled types is more expensive; their cost to the users is higher; and there is the greater need for employing external shades for the protection of the invaluable vision of the users. We are not inclined to think that this can be called real progress. It may be one form of progress, with a heavy—perhaps countervailing—discount attached to it. But the electrical people, from their narrow observation of things, seem to think it is all good progress. At the recent Illuminating Engineering Conference, Mr. W. R. Rawlings called attention to this point; and, in his opinion, it represents a great waste of electrical energy. He urged that there is still a want of co-operation between electricity suppliers and lamp manufacturers and users. He finds the tendency in modern electrical practice is to employ light sources of high intensity, and then, by means of devices—such as semi-opaque screens—to shut out part of the light, in order to avoid glare. The result of this is waste of energy. The necessity is due to the high intrinsic brilliancy of the lamps; and this is a bad quality in lamps used for domestic or other purposes where light and eyes are brought into intimate relationship. Long ago we referred to this; and certain electrical men simply laughed at the argument. Their crude view was that the light was there, and that the surrounding or under fitment, which corrected matters so far as intrinsic brilliancy was concerned, simply had the effect of causing a better distribution of the light. But it is impossible to interrupt light in this way without causing loss. There is absorption with every interposition between the source and the object to be illuminated. This really is not a matter which concerns the gas industry; it is to its competitive advantage. The higher the intrinsic brilliancy of electric lamps, the greater their cost, and the higher the expenditure on the corrective media. But the men of the electricity supply industry have no regard to these points; they still make their calculations and appraise the value of their lamps on their naked light-giving power. The losses through the corrective media pass unnoticed; and the actual net value is something of which they decline to speak. This is especially seen in their estimates for lighting. With the gasfilled lamp they simply calculate (if honesty prevails) on 0·7 watt per candle power, and tell their credulous customers that is the light they will get. The deductions that should be made through the employment of the corrective surroundings go unheeded. By numbers of electrical men it is not regarded as their business to be perfectly frank; and this applies to cooking and testing, as well as to lighting.

Waste of Electrical Energy.

Between now and the end of October, the Shropshire, Worcestershire, and Staffordshire Electric Power Company will, in connection with the local distributing companies, be holding exhibitions in various important industrial centres in the Midlands. Kidderminster has been visited; there are bookings for Dudley, Smethwick, Redditch, Bromsgrove, and Halesowen. The present demonstration campaign is mainly to give a fillip to the use of domestic electric appliances; and it is hoped to go over the same ground with an exhibition of industrial electric appliances. Such life on the part of the electrical competitors only acts as a tonic to the gas suppliers. We do not know that in any one of the towns named the gas suppliers require anything to brace them up to apply legitimate propaganda and wise methods and policy in dealing with their customers. But sound propaganda on the part of competitors only assists to energize their energy. The report in the "Kidderminster Shuttle" shows that the exhibition is a good one; and the Chief Engineer of the Power Company (Mr. J. T. H. Legge), who presided at the opening, gave evidence that the desire was to make a strictly practical demonstration, without the flavouring of stunting. The intention was to demonstrate the advantages of electrical appliances for many other domestic uses than lighting, as well as to impress traders and professional men with the increasing facilities which electricity offers at small cost. One does not know what "small cost" means in this relation. Cost becomes "small" not when regarded on the unit basis, but when the value rendered is greater for a given outlay than by any other method of doing the same work. And we know that for all heating operations (which the exhibition is designed to develop more than anything else) gas can easily beat electricity, at 2d., 1½d., or 1d. per KW.-H. Mr. Legge told his hearers that about the exhibition there was no "flavouring of stunting;" but the very first point the reporter makes in his account is: "In a handsomely furnished dining-room, a heating apparatus, quite simply manipulated by switches, was shown containing an ornamental glass representation of a glowing fire." That is sheer pretence. Electricians talk a lot about psychological effects—such as saying that by looking at something red one feels warm and comfortable. That is nonsense of an unadulterated order. With everything surrounding cold, the human body, when not actively moving, requires heat, and not something that merely looks red. Readers will be able to picture the other types of appliances that were on view; but it is no use referring to them here, as not knowing the prices charged for current, one cannot make useful comment—for example, as to the statement that 2 gallons of water can be brought to boiling point within fifteen minutes at a cost of less than twopence, and that all cooking can be done for an average of 1½d. a day per person.

A Peripatetic Show.

In the "Electrical Review," there has been some correspondence between an anonymous "Assoc.M.Inst.E.E." and Mr. J. R. Bradshaw, the Engineer of the Retford Corporation Gas and Water Works. The anonymous one seems to have a rare fund of postulation; and we should like him to give some concrete evidence as to the ground for this possession. We are rather inclined to think from the character of his letter that what he does not know about gas, its applications, and efficiencies would fill a good-sized volume; what he does know would only require a very few pages for its accommodation. He says it is extremely doubtful whether the average thermal efficiency of the use of gas and coke for lighting, heating, and power exceeds the maximum for a gas-engine—viz., 30 p.ct. Why does he say that? It would help the controversy he has in hand if he would give his reason, and supply positive results rather than merely express a doubt. Previously he submitted that the over-all thermal efficiency of the gas-works process is 65 p.ct. Then by taking his imaginary figure of 30 p.ct., he says that the combined over-all thermal efficiency of production and use "probably"

A Retailer of Postulation—Illustrated.

does not exceed 65 × 30/100, or (say) 20 p.ct., which electricity can equal. That we absolutely deny. If it did, it would have to be on the highest efficiency of electricity production ever attained in this country; and there would have to be 100 p.ct. efficiency in use for all purposes. But the anonymous critic shields his nescience as to gas behind such expressions as "extremely doubtful" and "probably." Then he ascends into the clouds, and further shows that he has but a superficial acquaintance with the relative merits and possibilities of high and low temperature carbonization by proposing that electricity should be produced in combination with gas, in the same apparatus and by low-temperature carbonization. It is suggested that low-temperature carbonization should be carried out by means of the flue gases from a boiler furnace, the whole of the coke as it issues from the retort being used in the furnace to generate high-pressure steam—apparently for application to the generation of electricity. But what a lot of coal would be required to produce the gas therms required for meeting even the present demand, and what a big waste of volatile matter there would be in using low-temperature coke for no better purpose than generating steam! He thinks that both the gas and the electricity processes stand in need of improvement, and that there is ample scope for experiment and research. There is indeed. But we are not struck by the method proposed by "Assoc.M.Inst.E.E." for "improving" the processes, and making them work together in what he considers beneficent harmony. We never think it is really good practice to displace economy by uneconomy.

Dissatisfaction with the Wembley Electric Lighting.

In the editorial columns of the "JOURNAL" for Aug. 20, reference was made to the existence of electrical dissatisfaction with the lighting of the grounds at the British Empire Exhibition; and there is also no doubt of disturbance of the electrical mind regarding the repeated failures of the electric current in different parts of the great show. Just before writing this paragraph, we saw in a morning paper the announcement that the previous evening a short circuit plunged the Stadium into darkness; and the pageant had to be performed by the aid of searchlights. Regarding the night illumination of the Exhibition—particularly the grounds—it is observed that the "Electrician" admits that it has not been all that was hoped. There have been difficulties; and the belief is that if the original plans had been carried out completely, very different results would have been attained. But our contemporary inserts a little palliation. It remarks: "In justice, it must be said that the lighting in general does form a distinct advance on previous efforts in this country. There has been a pleasing departure from the glare of bare lights characteristic of exhibitions in the past. Much of the interior lighting is done on sound lines; and we have progressed beyond the conditions when every exhibitor was a law unto himself, and when a lavish display of unscreened sources too effectively killed the restrained, but more artistic, efforts of a neighbour." If the lighting is an advance on previous efforts in this country, the results of those efforts must have been terribly bad—especially when the dissatisfaction is due to what has been done not coming up to the standard that was hoped for. Alluding to the exterior lighting, the "Electrician" says "unflattering comparison has been made with the gas-lighted section, where the volume of light is admittedly greater." But it is submitted by our contemporary that the functions of lighting in an Amusement Park, where brilliancy is the main consideration, differ from those of the lighting of the main part of the Exhibition, where something more dignified is desirable. Our impression has been that the lighting of the Amusements Park is effective from the illuminating point of view, that the lamps cause the area to be bright and therefore attractive, and that through these qualities nothing is lost in dignity. That is a better blend than dignity and inefficiency. It is complained by many exhibitors that after nightfall (which happens earlier day by day), the less attractively lit parts of the grounds and therefore the exhibition buildings lose visitors, who are drawn to the Amusements Park by the brightness and life to be found there. However, our contemporary, pursuing its mitigating efforts on behalf of the electric lighting, says the use of concealed lighting was correct, but it seems evident that the energy required was under-estimated. Under-estimating is an old failure in the electricity industry. We should very much like to know the relative cost per 1000 c.p. of useful light of the gas lighting of the Amusements Park and the electric lighting of other parts of the grounds, and what the cost would have been on the same basis had more energy been supplied to give more illumination outside the concealment necessitated by the glare within. Our contemporary closes its note on the subject with the words: "Possibly if the lighting arrangements at Wembley had been under the control of a really representative and powerful Committee, a scheme of illumination worthy of the occasion would have been produced. As it is, there has been we fear, a partial failure."

Scottish Junior Gas Associations.—Acknowledgment is made of the receipt of a copy of the Joint Transactions of the twentieth session of the Scottish Junior Gas Associations, Eastern and Western Districts. It contains a record of the 1923-24 proceedings, and in addition to this there is a list of the members of the two Sections.

A UNITED STATES GAS ENGINEERING COURSE.

Following upon efforts made towards this end by a Southern Gas Association Committee under the chairmanship of Mr. Edward L. Rieha, a new course in gas engineering will be opened in Johns Hopkins University, Baltimore (Md.), when the new session begins on Sept. 30. This further practical manifestation of appreciation in the United States of the need for the utmost possible educational facilities in connection with the gas industry will be widely welcomed, for though the course is fostered by the Southern Gas Association, it is open to all who may be interested; and the names of prospective students should be forwarded to Dean J. B. Whitehead, of the School of Engineering at the University.

For the establishment of this Chair in Gas Engineering, subscriptions have been secured from gas companies, manufacturers, and individuals, who understand what benefits are likely to accrue from it. In fact, practically the entire amount of subscriptions needed to cover the first year had been collected some weeks ago. In conformity with the regulations pertaining to other departments of the University, the tuition for undergraduate students is $250 a year, and for graduate students $150. In addition to tuition, laboratory fees, text books, &c., will require about $75 a year. The following circular describes the course.

GAS ENGINEERING.

The course in gas engineering has as its primary object the offering of instruction in the field of gas engineering to graduate students who have taken the necessary preparatory studies in mathematics, physics, chemistry, and mechanical engineering. Such students will take further courses in chemistry, mechanical engineering, and other subjects related to the gas industry—as, for example, gas manufacturing and distribution, fuels and gases, refractories, and the like—together with laboratory and research work. Graduate students with the requisite preparatory training should be able to complete this course in two years.

Undergraduate students will be admitted to a four-year course in gas engineering. The courses of the first two years will consist largely of those found in the courses in Electrical and Mechanical Engineering and in chemistry. The professional courses bearing directly on the field of gas engineering are placed in the third and fourth years. Students completing these courses will receive the degree of Bachelor of Engineering, and will be encouraged to go further in the field of advanced study and research.

The courses will be accompanied by laboratory work. Ample facilities for undergraduate instruction are provided in a separate laboratory building and in connection with the steam power station. Provision is made for the addition of further equipment as needed. The research laboratory is provided with gasholder, retorts, and apparatus for the recovery of bye-products from coal combustion and for other allied problems.

The gas bye-products laboratory is probably the only complete plant of its kind in America, and is available for research work for students desiring to follow gas engineering. It includes a 400-lb. retort, hydraulic main, condensers, tar extractor, scrubbers, purifier, tar and ammonia tanks, and gasholder. Meters, gas analysis apparatus, and calorimeters are available. Some valuable investigations have already been made with this equipment.

Arrangements have also been made for taking advantage, for the purpose of instruction and experiment, of the plants of several large gas industries in and around Baltimore.

These courses will be welcomed as offering special opportunities to: (1) Men who have already been engaged in the gas industry, who already have a certain technical knowledge, and who desire to perfect themselves professionally for positions of wider responsibility. (2) Technical employees of gas companies of various types for whom advanced scientific training or investigation and research is desired. Companies having special problems for solution may send a representative to the University for study and prosecution of this problem. (3) Promising young men with no technical training, who desire to enter a regular four-year undergraduate college course, leading to a degree in Gas Engineering. Such young men should be graduates of approved high schools. (4) Promising young men who are sons of employees of gas companies. Young men of this type are being assisted by an increasing number of companies in other fields of industry throughout the country as a part of a general plan for rewarding faithful services, and for improving the future personnel of the body of employees.

The sound steps which have, as indicated, been taken by the Southern Gas Association Committee in this matter, have been dictated by their conviction that the future expansion of the gas industry will be largely dependent upon the thorough knowledge and ability of the men connected therewith, and the realization by them of the many great possibilities of gas and its application in all its various phases.

Ceramic Society Refractory Materials Section.—There is to be a meeting of the Refractory Materials Section of the Ceramic Society at the British Empire Exhibition on Thursday and Friday, Sept. 18 and 19, under the Presidency of Mr. J. Holland. The list of papers to be submitted, which is a full one, includes "A Comparison of Gas and Coke Fired Drying Stoves," by Mr. T. W. Barley; "Some Properties of Clay Sillimanite Mixtures," by Prof. J. W. Cobb, C.B.E., B.Sc., F.I.C., and Mr. H. S. Houldsworth, B.Sc.; and "The Action of Heat on Kaolinite and other Clays," by Dr. J. W. Mellor and Dr. A. Scott, M.A.

INSTITUTION OF GAS ENGINEERS EDUCATION SCHEME.

Successful Candidates in Gas Engineering and Gas Supply Examinations.

THE following is a full list of the successful candidates at the first examinations in Gas Engineering and Gas Supply, held on May 3 and May 10 last, in connection with the Education Scheme of the Institution of Gas Engineers. In forwarding this, Mr. Walter Hole (the Organizing Secretary) points out that it has been very much delayed owing to the necessity of obtaining information as to the ancillary subjects taken by the Internal Students at the various Technical Institutes.

COLLEGE TRAINED STUDENTS.

BRADFORD TECHNICAL COLLEGE.

Gas Engineering—Ordinary Grade.

SECOND CLASS.

	Ancillary Subjects Taken.
*Barwick, John Clapham . .	Mathematics. Engineering Science. Inorganic Chemistry. Do. Practical. Organic Chemistry. Do. Practical. Engineering Drawing.
Cowley, Leonard Reginald . .	Inorganic Chemistry. Do. Practical. Organic Chemistry. Engineering Drawing.
*Lister, Horace.	Mathematics. Physics. Engineering Drawing. Inorganic Chemistry. Do. Practical. Organic Chemistry. Do. Practical.
*Roberts, John	Mathematics. Physics. Engineering Drawing. Inorganic Chemistry. Do. Practical. Organic Chemistry. Do. Practical.
*Thompson, Robert J. S. . .	Engineering Drawing. Inorganic Chemistry. Do. Practical. Organic Chemistry. Do. Practical.

* Awarded the College Senior Course Certificate in Gas Engineering, July, 1924.

HALIFAX MUNICIPAL TECHNICAL COLLEGE.

Gas Engineering—Higher Grade.

FIRST CLASS.

Dean, Trevor	Mathematics. Organic Chemistry. Inorganic Chemistry. Mechanical Engineering. Physics.

SECOND CLASS.

Crowther, Reuben	Inorganic Chemistry. Organic Do. Mathematics. Engineering Science. Machine Drawing. Building Construction. Physics.

Gas Engineering—Ordinary Grade.

FIRST CLASS—WITH DISTINCTION.

Jackson, John Cyril	Machine Drawing. Practical Mathematics. Physics. Chemistry.
Knowles, Horace Henry . .	Machine Drawing. Practical Mathematics. Chemistry. Engineering Science.

FIRST CLASS.

Crossland, Harold Vincent .	Machine Drawing. Practical Mathematics. Chemistry. Engineering Science. Heat Engines.
Eastwood, William Patchett .	Machine Drawing. Practical Mathematics. Physics. Chemistry. Engineering Science.

SECOND CLASS.

Mackie, Norman Frederic . .	Machine Drawing. Practical Mathematics. Physics. Chemistry. Engineering Science.
Moore, Bernard	Machine Drawing. Practical Mathematics. Engineering Science.
Owen, John Richard . . .	Chemistry.
Stott, Eric	Machine Drawing. Practical Mathematics. Engineering Science.
Whiteoak, Allan	Machine Construction. Practical Mathematics. Do. Chemistry. Theory Do. Physics.

HUDDERSFIELD TECHNICAL COLLEGE.

Gas Engineering—Ordinary Grade.

FIRST CLASS—WITH DISTINCTION.

Thorpe, B.	Inorganic Chemistry. Organic Do. Machine Drawing. Coke and Bye-Products. Coal Tar Distillation.

FIRST CLASS.

Beaumont, F.	Inorganic Chemistry. Organic Do. Mechanics.

SECOND CLASS.

Milnes, A.	National Certificate of Chemistry.
Hinchcliffe, J.	Inorganic Chemistry. Mechanics.
Telford, F.	Inorganic Chemistry. Organic Do. Mechanics. Mathematics. Coke and Bye-Products. Coal Tar Distillation.

Gas Supply—Ordinary Grade.

FIRST CLASS.

Beaumont, F.	Inorganic Chemistry. Organic Do. Mechanics.
Thorpe, B.	Inorganic Chemistry. Organic Do. Machine Drawing. Coke and Bye-Products. Coal Tar Distillation.
Telford, F.	Inorganic Chemistry. Organic Do. Mechanics. Mathematics. Coke and Bye-Products. Coal Tar Distillation.

SECOND CLASS.

Milnes, A.	National Certificate of Chemistry.
Hinchcliffe, J.	Inorganic Chemistry. Mechanics.
Beaumont, A.	Inorganic Chemistry. Organic Do. Mechanics.

MANCHESTER COLLEGE OF TECHNOLOGY.

Gas Engineering—Higher Grade.

SECOND CLASS.

Lloyd, Horace	Physical Chemistry. Physics for Chemists.

Gas Engineering—Ordinary Grade.

Beard, George F. H. . . .	Gas Engineering Calculations. Mechanics. Do. Lab. Building Construction.

EXTERNAL STUDENTS.

Gas Engineering—Ordinary Grade.

FIRST CLASS.

	Ancillary Subjects Taken.
Canning, Thomas Anthony (Newport)	Mathematics. Physics. Chemistry. Machine Drawing. Mechanics.
Douglas, Robert (Workington)	Practical Mathematics. Applied Mechanics. Heat Engines. Engineering Drawing. Properties and Strength of Materials. Chemistry, Inter. B.Sc. Physics Do.

SECOND CLASS.

Bell, Arthur (Penistone) . .	Practical Mathematics. Inorganic Chemistry. Organic Chemistry. Laboratory Course for Gas Engineers.

Calderwood, Robert Wallace (Spalding)	Mathematics. Engineering Drawing. Inorganic Chemistry—Practical.
Davison, Henry Gordon (Chester)	Practical Mathematics. Engineering Drawing. Mechanics. Heat Engines. Building Construction. Inorganic Chemistry.
Haworth, Thomas (Oswaldtwistle)	Inorganic Chemistry. Organic Chemistry. Mathematics. Physics. Mechanics. Drawing.

Gas Engineering—Higher Grade.

FIRST CLASS.

Sheehan, Patrick Joseph (Cork)	Mechanics, B.E. Degree. Heat Engines Do. Machine Drawing Do.
Thorpe, Benjamin (Huddersfield)	Mathematics. Machine Drawing. Mechanics and Heat Engines. Inorganic Chemistry. Organic Chemistry.

***Gas Engineering—Diploma.**

WITH DISTINCTION.

Gardiner, Percy Cyril . . .	Mathematics. Physics. Inorganic Chemistry. Do. Practical.

* These results have already been published.

Gas Engineering—Diploma.

FIRST CLASS.

Ancillary Subjects Taken.

Hood, John (Shrewsbury) . .	Mechanical Engineering, Inter. B.Sc. Inorganic Chemistry, Inter. B.Sc. Organic Chemistry, Inter. B.Sc. Coke Manufacture.

Gas Supply—Ordinary Grade.

FIRST CLASS.

Canning, Thomas Anthony (Newport)	Mathematics. Chemistry. Physics. Machine Drawing. Mechanics.
Haworth, Thomas (Oswaldtwistle)	Inorganic Chemistry. Organic Chemistry. Mathematics. Physics. Mechanics. Drawing.

SECOND CLASS.

Douglas, Robert (Workington)	Practical Mathematics. Applied Mechanics. Heat Engines. Engineering Drawing. Properties and Strength of Materials. Chemistry, Inter. B.Sc. Physics, Inter. B.Sc.

LOW-TEMPERATURE CARBONIZATION OF COAL.

Conditions under which the Department of Scientific and Industrial Research are Prepared to Test Plants.

The Department of Scientific and Industrial Research, Old Queen Street, S.W. 1, are prepared to undertake in approved cases tests on plants for low-temperature carbonization. The objects of the tests are to ascertain the quality and quantity of the yields of coke, tar oil, gas, and ammonia, the throughput of the plant, working temperatures, and general ease and reliability of working. No charge will be made by the Department in respect of the tests, but applicants will be required to comply with certain conditions and to sign an agreement embodying the terms on which this offer is made. Forms of application may be obtained from the Secretary, Department of Scientific and Industrial Research, 16, Old Queen Street, Westminster, S.W. 1. The nature of these conditions can be ascertained from the following particulars, but the Department reserve the right to add to or alter them.

(1) Applicants will be required, before the Department can undertake a test, to supply full information as to the nature of the plant and the results obtained, and to afford facilities for the inspection of the plant by one or more officers of the Department, and generally to satisfy the Director of Fuel Research that the plant is giving reasonably good results and is of such a size that its performance will be comparable with that of a similar plant operating on a commercial scale.

(2) Tests will be under the continuous supervision of such members of the Fuel Research Staff of the Department as the Department may decide, who may take as samples such amount as they may consider necessary both of the coal used and of the products.

(3) Applicants must at their own expense provide all necessary facilities, including all material, staff, and labour required for running the plant, and for such assistance in taking samples and measurements as may be required by the Department or their officers supervising the test.

(4) Until the information referred to in paragraph (1) above has been supplied, and a preliminary inspection of the plant has been made, it is impossible to state what facilities will be required or to give any indication of the programme or possible duration of the test, which may vary from several days to several weeks according to circumstances.

The necessary facilities will in any event include proper arrangements for taking such measurements as will give a satisfactory weight balance between the input and output of the plant.

(5) Applicants will be permitted to have a representative present during the test, who will be allowed to check any weights or measurements forming an integral part of the test.

(6) The decision of the supervising officer of the Department in charge of the test will be final in regard to all questions relating to the duration and conduct of the test, and all weights, measurements, and other matters in connection therewith.

(7) The Department reserve the right to publish a report on the test at any time at their discretion, but will before so doing consult the applicants, and any views the latter may express will receive consideration. A copy of the report will, at the request of the applicants, be furnished to them free of charge. Applicants will not be entitled to publish or communicate to third parties such report or any extract from or allusion to it without the consent in writing of the Department. Consent may be conditional.

GAS UNDERTAKINGS RETURN FOR 1923.

Part 1. Issued by the Board of Trade.

On the eve of going to press with this number of the "JOURNAL," there was issued Part I. of the Board of Trade Return relating to all Authorized Gas Undertakings in Great Britain for the year 1923. This is the part which gives particulars in regard to the manufacture and supply of gas. It is published by H.M. Stationery Office (Imperial House, Kingsway, London, W.C. 2, and Branches), at the price of 5s. net.

Full notice of the information which the return contains must be postponed to the next number of the "JOURNAL." It may, however, be mentioned now that the return deals with 790 undertakings, and that in its scope it is similar to that for the previous year. Again the quantities of gas made and sold are shown both in cubic feet and therms, if the undertaking was authorized during any part of the year to charge for heat units supplied.

In 1923, the quantity of coal carbonized by the authorized gas undertakings of Great Britain was 16,460,632 tons, of coke employed for water gas 906,717 tons, and of oil used 42,751,644 gallons. The amount of coal gas made was 217,756,730,000 c.ft., and of water gas 38,347,643,000 c.ft. The total quantity made (including 3,745,163,000 c.ft. of "other gas") was 259,849,536,000 c.ft. The return intimates that the number of therms made and sold by all undertakings cannot be given. The total quantity of gas sold was 241,626,603,000 c.ft., divided up as follows: To prepayment consumers, 82,404,187,000 c.ft.; to ordinary and power consumers, &c., 150,256,712,000 c.ft.; and for public lamps, 8,965,704,000 c.ft. The residuals made were: Coke and breeze, 11,098,169 tons; tar, 181,962,574 gallons; and sulphate of ammonia, 117,166 tons. The prepayment consumers numbered 4,231,243, and the ordinary consumers totalled 3,579,107. In all there were 40,984¼ miles of mains.

The quantity of gas made during 1923 was 7,779,215,000 c.ft. in excess of the quantity made in 1922, but the increase in coal gas made was 15,793,184,000 c.ft., there being a decrease of 5,598,486,000 c.ft. in the water gas made, and of 2,415,483,000 c.ft. in "other gas." Some 553,537 tons more of coal were carbonized than in 1922, while 51,192 tons less of coke were used in the manufacture of water gas than in the previous year. The coke and breeze made in 1923 exceeded that of 1922 by 623,014 tons. The quantity of gas sold increased by 9,023,814,000 c.ft., showing a decrease in the amount of gas used at works and lost by leakage or otherwise of 1,244,599,000 c.ft. The number of consumers increased by 138,204—two-thirds of these being prepayment consumers.

Yorkshire Junior Gas Association.—Mr. R. E. Gibson, Engineer to the Liverpool Gas Company, will address the Association at their annual general meeting, to be held on Oct. 18, in the Leeds University.

Wills.—The valuation for probate of Mr. David Terrace's estate is £6444, with net personalty £5546.—Mr. William P. Ingham, of Redcar, who was Deputy-Chairman of the Leeds Fireclay Company, Ltd., left estate of the gross value of £21,384, with net personalty of £19,624.

TECHNICAL NOTES FROM THE SOCIÉTÉ TECHNIQUE MEETING.

[From "Le Génie Civil," July 12 and 19.]

(*Continued from p.* 694.)

CONTROL OF SETTINGS AT THE GENNEVILLIERS WORKS.

In this paper, which was of considerable length, M. A. Bazille discussed certain general deductions he had made from careful tests and observations carried out on the producers, recuperators, and combustion chambers at the Gennevilliers Works of the Société d'Eclairage, Chauffage et Force Motrice.

If, by one means or another, it is necessary to clinker the producer fuel bed in order to supply sufficient gas to the setting, the calorific power of this gas is always observed to fall for a short period after the cleaning; the reason being that combustion in the neighbourhood of the grate becomes temporarily less incomplete. The author shows in fig. 1 his record of the CO and CO_2 contents of the producer gas between clinkerings (percentage contents being plotted against hours); and the fall in CO and the rise in CO_2 five minutes after cleaning are clearly seen.

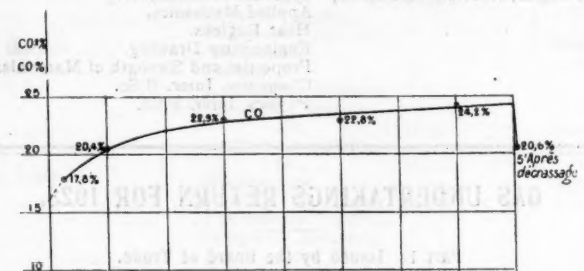


Fig. 1.—Influence of Clinkering on Gas Composition.

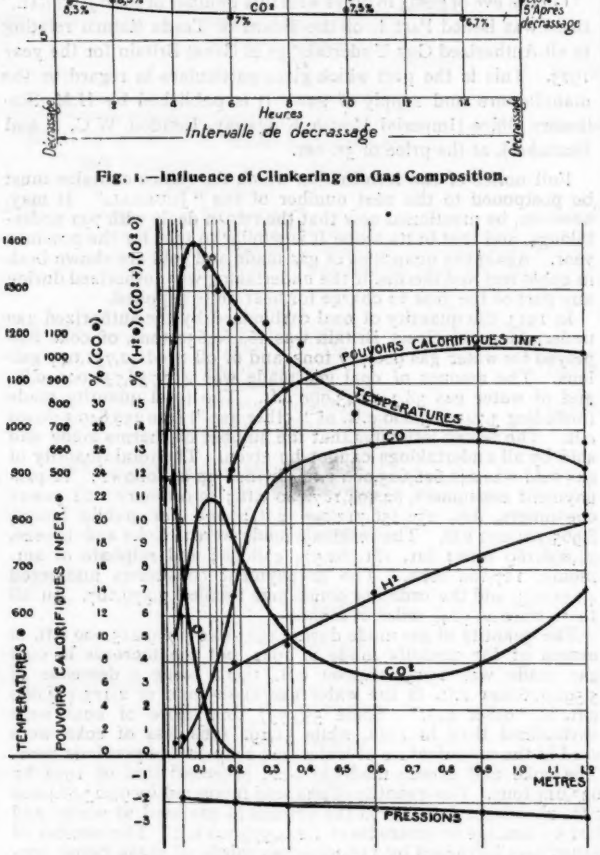


Fig 2.—Temperatures, Gas Analyses, and Pressures at Distances *mn* from the Grate.

Fig. 2 shows analyses of the gas taken from various distances from the grate along the line *mn* in fig. 3—a section through the type of producer employed for the tests.

In order to avoid short-circuiting of secondary air into the flues, through thin and rather porous ducts, the author advocates reducing in the flues the pressure fall which is due to chimney draught. He has succeeded in lowering to 5·5 mm. the pressure difference between secondary air and waste-products flues, and thus realizes a temperature difference of 700° C.

Careful control of the settings has resulted in recent years in the producer fuel consumption being reduced by about 13 p.ct.

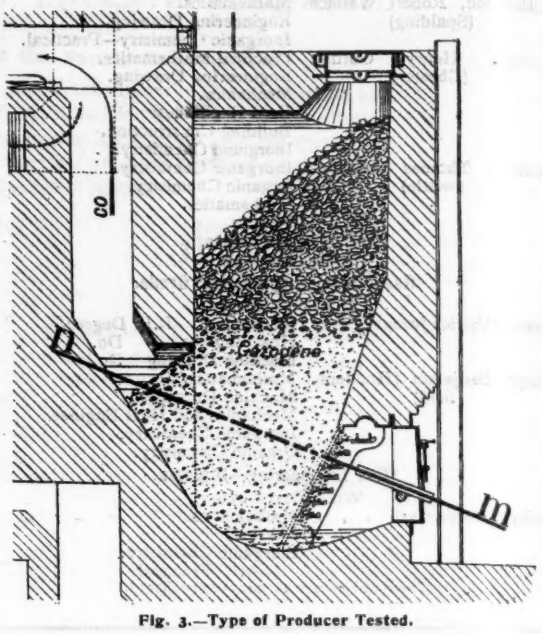


Fig. 3.—Type of Producer Tested.

VARIATION OF FUEL CONSUMPTION WITH RATE OF CARBONIZATION.

M. A. Grebel pointed out in this communication that it is wrong to measure the maximum consumption of coke (dry and 10 p.ct. ash) in a retort setting simply as a percentage of the maximum coal carbonized in 24 hours; thus—$C_m = nH_m$, where is a coefficient between 0·125 and 0·250. If this were so, the coke consumption curve would be a straight line, as OC in fig. 4. It will

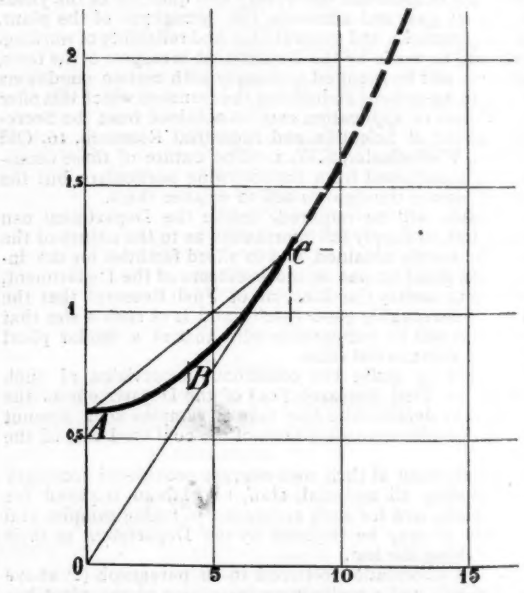


Fig. 4.—Curve of Fuel Consumption for Setting of Nine 3-metre Retorts.

be realized that merely in order to maintain the retort temperature against heat losses, without allowing for the charge, requires a certain weight of coke K_o dependent upon the type and capacity of the setting; and $K_o = pH_m$ (the coefficient p varying between 0·05 and 0·15).

So that we arrive at something less simple for the optimum expenditure of fuel C_d for the carbonization of a quantity of coal H_d. Originally M. Grebel held to a straight-line formula

$$C_d = K_o + gH_d$$
$$or \quad C_d = pH_m + gH_d$$

(g usually falling between 0·05 and 0·10).

This is still represented by a straight line AC, but having its origin A at a point corresponding to the consumption when "banked" at night.

The author has now established the fact that the curve is a parabola ABC; the formula being

$$C_d = K_o + qH^2_d$$
$$or \quad C_d = pH_m + qH^2_d$$

(q lying between 0·003 and 0·03).

Thence the following results have been obtained:

For setting of five 3-m. horizontals:

$$C_d = 0{\cdot}10\ H_m + 0{\cdot}022\ H^2_d.$$

For setting of seven 3-m. horizontals:

$$C_d = 0{\cdot}08\ H_m + 0{\cdot}015\ H^2_d.$$

For setting of nine 9-m. horizontals:

$$C_d = 0{\cdot}075\ H_m + 0{\cdot}010\ H^2_d.$$

For setting of nine 6-m. horizontals:

$$C_d = 0{\cdot}06\ H_m + 0{\cdot}004\ H^2_d.$$

The maximum coke consumption of course increases with the exposed surfaces of the plant; and with intermittent verticals, for instance, the figure is higher than for a setting of 6 m. horizontal retorts of equal carbonizing capacity. For such plant the formula becomes

$$C_d = 0{\cdot}085\ H_m + 0{\cdot}0085\ H^2_d$$

M. Grebel considers that each manufacturer should not only determine the optima coke consumptions corresponding to the points C and A, but also prepare formulæ and curves for his various designs of setting; and on these lines guarantees might be given to the engineers of smaller works, where carbonizing is only carried on during the day. Of course, for results to come up to guarantee it would be necessary to exercise careful control; but much can be done by ensuring even charges and graduating primary and secondary air dampers to correspond to certain draughts and heats.

Debenzolization Employing Waste Heat.

M. O. Guillet, introducing his paper on the above subject, remarked that it is possible to raise, in a waste-heat boiler employing the products from a retort setting, 1 to 2 kg. of steam per kg. of coke burnt in the producer. Steam raising by this method requires practically no supervision, and gives sufficient steam to work-up the liquor, run the exhausters, &c. The author suggests the further use for the waste products (which he says retain a sensible heat of 200° to 220° C. after traversing the waste-heat boiler) of assisting in the process of debenzolization. The arrangement of the plant for this purpose is shown in fig. 5 (the French nomenclature in which will be easily understood by all).

The stream of purified but unmeasured gas is treated with cold anthracene oil in a rotary washer; 1 to 1·5 litres of oil being required per cub.m. of gas scrubbed. The benzolized oil leaving this washer is pumped to a condenser, where it is raised to 60° C. at the expense of crude benzole and steam. Thence it traverses a tubular heater situated in the waste-gas flue, being then raised to a temperature of 130° C., and is forced to a column also interposed in the flue, the temperature of which is about 200° C. A jet of steam carries away crude benzole vapour from this column; and the oil flows away to be cooled before re-circulation.

The crude benzole vapour and steam leave the column at about 130° C., negotiate the above-mentioned condenser, and are separated in a Florentine flask. Thence the crude spirit is run into a small still—capacity about 24 hours' make—in a compartment connected by dampers with the waste-gas passage; and here rectified benzole is driven off with the assistance of a steam coil in the still. The residue of water is then filtered away, and the benzole measured and stored. The residue from the still contains 5 to 7 p.ct. of benzole, besides all the naphthalene removed from the gas by the original washing.

M. Guillet states that a very great saving in steam is realizable by this means. The water condensate in the mixture leaving the column is barely half the amount of crude benzole; and the extra steam for the rectification is only about 10 p.ct. of the "motor spirit" product. The author also cites additional advantages of scrubbing for benzole—namely, the almost complete removal of naphthalene, and the considerable reduction of carbon bisulphide and hydrocyanic acid in the gas. It is pointed out, however, that if flue gases at 200° C. are employed in apparatus situated between a waste-heat boiler and the chimney, it is necessary to induce the draught on the setting by a fan, which means an extra expense.

In the subsequent discussion, M. Grebel said the proposed system seemed somewhat retrograde, since direct heating for such a purpose was being superseded. However, the suggestion for employing the more or less constant heat of flue gases had much to commend it. M. Grebel took the opportunity, though confessing that at the present time he was not an advocate of debenzolization, of remarking upon a weak spot in many of the washers on the market—that with them there was insufficient time contact between the gas and the oil. For instance, with tray scrubbers there was contact of only some tenths of a second, with the result that not more than 60 p.ct. of the benzole was recovered from coke-oven gas, some 12 gr. per cub.m. remaining therein. Wood or wire grids as packing effected better results, the benzole content being reduced to about 3 gr. per cub. m.

The Thomas Meter.

For the measurement of large makes of gas, said M. Guérin, in introducing a paper on the above subject, volumetric meters are cumbersome and costly, and it is necessary to apply corrections for temperature, pressure, and humidity. With the Thomas meter, which (as most "JOURNAL" readers are aware) was invented in America and now has a widespread use in that country, and which takes up comparatively little room, the volume of gas which passes is measured by the quantity of heat (or rather of electric energy) required to raise its temperature a certain amount—say, 1° or 2° C. It is taken that, within limits, the specific heat of the gas is constant whatever its pressure and temperature.

M. Guérin then proceeded to describe the meter, drawings of which were included in the paper, and mentioned that with it results were obtained which agreed within ± 1 p.ct. of those given by meters working on other principles.

In the discussion M. Grebel briefly reviewed the working basis of various meters. Theoretically, he said, those which were less costly and less bulky than the old wet meter could not be so accurate, as they did not directly measure the volume of gas passed. Instruments on the "Venturi" principle—based on the fact that loss of pressure was proportional to the square of the velocity—supposed the density constant. Rotary meters supposed the speed of revolution directly proportional to the volume passed. The Thomas meter supposed the specific heat constant whatever the temperature and pressure of the gas. Actually, the specific heat of methane between 1° and 10° C. was 3 p.ct. higher than that of carbon monoxide and hydrogen; but it was an easy matter to apply, daily or at any moment, a correction for variation in the methane content.

The author, replying to a question by M. Rolland d'Estape (the new President), stated that the consumption of current was normally about 1 watt-hour per cub.m. of gas. M. Laurain remarked that this was not negligible, and in the accounts should be capitalized with the installation cost.

A Purification Wrinkle.

M. Rutten, a delegate from Holland, related the excellent results he has obtained for nine years from a simple modification of ordinary purifier practice. On the surface of the oxide in the purifier he forms furrows some 30 cm. centre to centre and 15 cm. deep, instead of carefully levelling off the material as is usually done. It appears that this prevents the hardening of the top layer, which consequently offers less resistance to the gas.

(To be continued.)

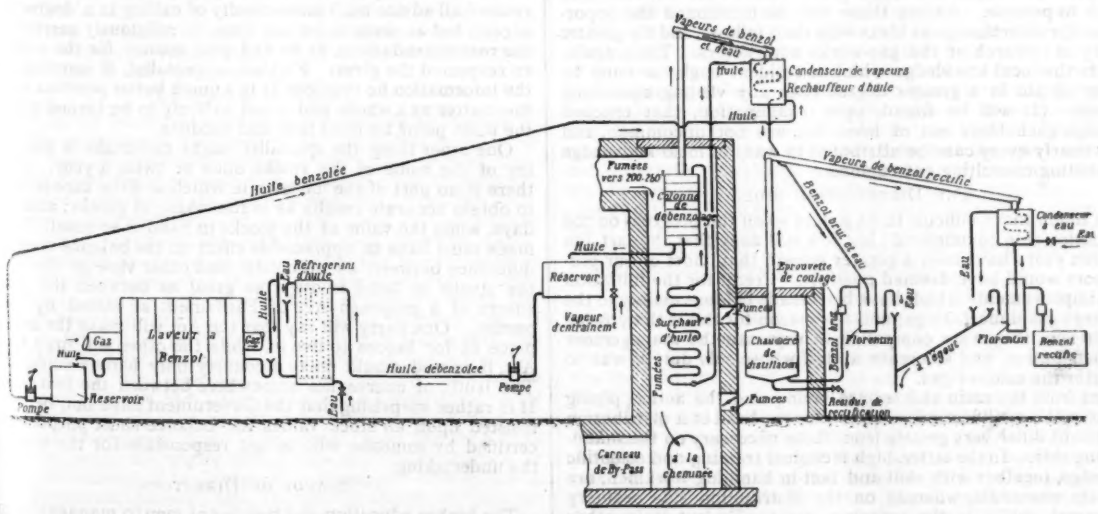


FIG. 5.—BENZOLE PLANT EMPLOYING HEAT OF FLUE GASES.

THE PRESENT POSITION OF THE GAS INDUSTRY.

By a GAS ENGINEER

[With the opinions expressed in this series of articles, the Editor does not necessarily associate himself.]

Final Article.—Previous Articles of the Series appeared in the "JOURNAL" last April.

During the last thirty-five to forty years, the gas industry has been passing through a transition stage, and although, perhaps, it is too soon to be positive, it is certainly probable that we have arrived at a point when we can forecast fairly accurately what duties and qualifications will be demanded from future applicants for positions in our midst. The transition stage may be said to have started with the adoption of the principle of gaseous firing for the heating of retorts. The higher heats of carbonization thus obtained resulted in makes of gas per ton of coal previously unheard of, and started a rivalry between works which continues to the present day, and will probably continue so long as the gas industry endures.

ON THE WORKS.

Anyone who looks at the old carbonizing books will find that in a large number of cases the make of gas per ton was put down at a fixed figure each day, generally 10,000 c.ft., and this figure was either corrected when the periodic stocktaking came round, or, in a great many instances, the actual working results were never known. This laxity soon disappeared. The competition as to which company (or manager) should have the honour of making the most gas out of a ton of coal grew keener and keener, and the success or otherwise of an undertaking was judged as much from this point of view as from the financial results of the management as a whole.

This rather naturally led to a certain amount of overpulling, with a consequent deterioration in the quality of gas supplied, and, what was more harmful from a distribution point of view, a continually varying quality. Some few years ago, a make of gas of over 13,000 c.ft. to the ton was a spectacular result; and as the poor consumer found it difficult to gain a hearing, the attempts to reach this figure by undesirable methods were often undeservedly rewarded. It is more than probable that much of the present unpopularity of gas is due to the ill-doing of the past.

Regenerators marked a further advance, and the progress demanded a more considerable scientific knowledge than had hitherto proved necessary in the management and working of a gas-works, and also very much more careful building and designing in connection with the retort benches. Thus the scientific side of the manufacture of gas became much more prominent; and, as one reform leads to another, the whole system of gas manufacture underwent such an advance that the demand arose for a higher scientific and technical standard of education and training in those to whom the responsibilities of managing the works would be entrusted. The demand created the supply, and probably now there is no industry which has at its command a body of men more capable of dealing with all the aspects of its trade, both on the constructional as well as the manufacturing side, than has the gas industry.

The days of the consulting engineer, except for parliamentary work, special cases, and very small undertakings have gone, probably for ever. No one will attempt to belittle the work that the great consulting engineers have done in the past in building up the industry; and even if anybody attempted to do so it would be useless, as their names and work are on record and will never be forgotten. While agreeing with this, probably those who have the well-being of the industry at heart will also agree that the change is for the good, as the young, energetic, and highly trained men of the present day have advantages that their predecessors were not fortunate enough to possess. Among these may be mentioned the opportunities for interchange of ideas with their fellows, and the greater activity in research of the gas-works contractors. Then, again, there is the local knowledge which a resident engineer must be able to obtain in a greater degree than any visiting consulting engineer. (It will be found, upon examination, that cracked buildings, gasholders out of level, &c., are not uncommon, and can in nearly every case be attributed to want of local knowledge by a visiting consulting gas engineer.)

THE DISTRIBUTION SIDE.

It is much more difficult to fix a date when the progress on the distribution side commenced; but few will deny that the last ten or fifteen years have seen a greater growth than most of our predecessors would have deemed possible. Credit for the initiation of the improvements which have been made belongs mainly to the very large gas undertakings; and the reason for this is that, owing to their size, they were compelled to separate the management and distribution, and so create a staff whose sole duty it was to look after the sales of gas.

Apart from the main and service laying and the actual piping of houses, the qualifications required for the head of a distribution department differ very greatly from those necessary on the manufacturing side. In the latter, high technical training and scientific knowledge, together with skill and tact in handling workmen, are the main essentials, whereas on the distribution side ordinary commercial ability is the principal asset. To put it in other words, it is quite feasible to take a man from any branch of commerce and appoint him as head of a distribution department with most successful results, but it would be courting failure to take a man from (say) a big motor works and put him in charge of the manufacture of gas.

In the undertakings whose size does not justify the appointment of two independent heads, the solving of the problem of the necessary qualifications is not easy, as it is quite possible to appoint an engineer of high ability whose real attitude towards the distribution is that towards pictures of the scientist who once said that "photography was quite interesting, but for the pictures." Moreover, the position is further complicated by the type of directors who are in control. Too many of the directors of this size of works are old enough to remember the time when the staff consisted of a man and a boy, and can see no reason why it should be appreciably increased. (One Director the writer knows of always capitalizes the wages of any proposed new appointment. Thus a three-pound-a-week man to him means little else than an addition of £3000 to the capital of the undertaking; and he argues, and quite often carries his point, that "it is not worth it.")

A competent engineer appointed to take charge of an undertaking where re-organizing and re-building are required has a plain, straightforward problem before him, as he can study his subject, and in his report state very accurately what will be the financial result of the proposals he puts forward. If his report is accepted and the work carried out, a very short time will prove him to be either right or wrong. Naturally, with the knowledge he has of the results obtained elsewhere, he need have little fear of the result. If the distribution side requires re-organization, the new man is up against a very different proposition, as he has first of all to convince the directors that a re-organization is necessary—not an easy task by any means—and when he has done this he has to put forward proposals without being able to state with any degree of certainty what the financial results will be. Even if the proposals are adopted, the benefit derived therefrom is not easily or quickly apparent, and unless he has a very good system of records he may find it difficult to prove that any benefit at all has been obtained. Hard work in the distribution department is rarely productive of immediate results, and unless the head of the department is assured of the sympathy and complete support of the owners he is very much tempted to follow the line of least resistance, and carry on in the same old way as heretofore, without making that special and continuous effort which is required to raise the standard of his work above the ruck.

Under-staffing in medium-sized works is dreadfully prevalent, and the evils that result therefrom are many and various. Take a manager, for instance, with no assistant. He manages the manufacturing side with the aid of a works foreman who has probably been brought up on the works and has little idea of modern methods. The foreman may be, probably is, honest and industrious, but like all the best working men he is rabidly conservative in his ideas, and it requires the greatest tact and perseverance to imbue him with that enthusiasm which is so necessary for success. On the distribution side the same difficulty probably prevails, and is possibly intensified owing to the greater difficulty in proving the benefit of the suggested new ideas. If, in addition, the manager is blessed with directors who take too keen an interest in the details, and are continually dropping in between board meetings, his lot is not a happy one. More often than not he really has not time to think out and elaborate a complete scheme for the modernization of the distribution methods, and any piecemeal plan is often worse than nothing at all.

Although the demand for consulting engineers has to a very large extent passed away, there is a real need for experts on the distribution side, and it would be to a very great advantage, both to the gas industry and the executive heads of the smaller works, if there were more specialists available to work with the resident officials, to formulate complete schemes suitable to each undertaking for presentation to the boards of directors. Boards of directors are very like the Scotsman who, when he was not well, refused all advice until the necessity of calling in a doctor became urgent, but as soon as he had done so religiously carried out all the recommendations, as he had paid money for the advice, and so respected the giver. Further, a specialist, if supplied with all the information he requires, is in a much better position to look at the matter as a whole, and is not so likely to be turned away from the main point by local fads and faddists.

One other thing the specialist might undertake is the estimating of the value of the stocks once or twice a year. Probably there is no part of the industry in which so little care is exercised to obtain accurate results as in the taking of stocks; and in these days, when the value of the stocks in hand is so great, the errors made must have an appreciable effect on the balance-sheet. The difference between an optimistic and other view of the value of the stocks in hand is often as great as between the probable effects of a proposed Act of Parliament as stated by different parties. One party will say that the Act will make the country a place fit for heroes to live in, while the other will urge that the Act, if passed, would make a country only heroes could live in. The truth, of course, lies somewhere between the two opinions. It is rather surprising that the Government have not, before now, insisted upon all stock values for balance-sheet purposes being certified by someone who is not responsible for the working of the undertaking.

BOARDS OF DIRECTORS.

The higher education and training of men to manage the manufacturing side was, comparatively speaking, a simple matter, as

only a limited number is required on any works, seeing that no special qualifications are needed outside the technical staff; but on the distribution side education is necessary for practically all, from, and including, the directors down to the lowest grade of fitters and collectors. Many may smile, and some may sneer, at the idea of educating directors, but you might even go a stage further, and say that the shareholders should be educated as to the type of director they should elect. With the exception of water companies, the average age of the directors of the provincial gas companies is probably higher than that which prevails in any other branch of industry. (A man recently celebrated his 102nd birthday by being re-elected as a director of a water company, and the age of some of the directors of gas companies far too nearly approaches this figure.)

One other point is that no man should be elected a director as a recognition of services rendered as either engineer or secretary. To do so is wrong in principle, as it unfairly handicaps his successor. Much harm is done by such a procedure; and the more successful the retiring man, the greater the handicap upon his successor. Moreover, the longer a man has been in charge the more wedded he will be to the methods which have been so successful, in his opinion at any rate, and consequently the less likely he will be to consider fairly and adjudicate justly upon new, and possibly drastic, proposals which it is almost certain a fresh man will bring forward. Most boards of directors can be safely trusted not to be rushed into "wild cat" schemes, and a new man should be offered every inducement to propose anything which he thinks will be of benefit to the undertaking under his charge, without any fear that such proposals will be taken as a slight upon the past work or the capabilities of one of his own directors. All essential information necessary for the working of the concern should be so tabulated as to be at the service of the newcomer without his having to apply to his predecessor.

With the systematization of the working results now so general, it is a comparatively simple matter for any gas engineer to prepare a report on works reconstruction for submission to his directors, so that any intelligent body of men can come to a reasonable decision upon the points raised, without themselves having more than a very general knowledge of the subject. With regard to the distribution department, it is a much more difficult matter, as the ramifications are so great, the information obtainable from other companies so vague, and the conditions so variable, that unless the directors are prepared to give their manager a blank cheque it is necessary that even they should have some expert knowledge of the business for which they are responsible.

The Technical Press.

There are only two mediums through which the education, or as some may like to call it the enlightenment, of the directors can be carried out, and they are the "B.C.G.A." and the Technical Press. The methods employed would have to be the same in both cases, and the success or otherwise depends on the loyal co-operation of the individual concerns. The existing Technical Press is written mainly, and rightly so, for readers who have been trained from youth upwards for service on the technical side of the industry; and most of the articles written, and the reports read at the various meetings, contain matter which, while of the utmost service to those for whom it is prepared, is not in such a form as is easily assimilated by non-technical men. Directors have usually their own businesses to attend to, and the spare time they have to devote to gas matters is limited; and this consideration alone prevents most of them from studying to any extent papers written for either gas engineers or gas-works contractors. The same argument applies to the non-technically trained members of the staff, who usually have no opportunity to study papers during business hours, and who, although probably having little inclination to devote much of their spare time to work, yet need to be instructed in what is going on and what possibilities there are in their respective spheres. The circulation of "The Gas Salesman" is probably much greater than any gas paper published; but if a humble observer may be permitted to make a suggestion, it is that it should be more specialized than is now the case.

Be Up and Doing.

Space does not permit of considering in any detail the education of the subordinate members of the staffs, but there is no doubt but that on the distribution side every man, woman, boy, or girl employed requires some instruction in order to carry out efficiently the duties he or she has to undertake. From the salesman to the lamplighter each and all need some special training for their work. Examinations have their own sphere of usefulness, but this sphere, as far as gas distribution is concerned, is very circumscribed, and even if one could persuade the majority of the staff to prepare and enter for them, it is only a select few who would reap any benefit. With most, what training they get must be in the course of their work; and their willingness and ability to absorb what knowledge they can must be one of the main qualifications for their retention and promotion. A chief officer whose directors allow him a free hand in the appointment of his subordinates, and who do not bind him down to offering the lowest possible wages, is much to be envied, as he can then make his own appointments, partly with a view to relieving himself of much of the training of his juniors, thus giving him time to attend to other important matters which, though not always obvious, are nevertheless essential to the well-being and progress of the undertaking for which he is responsible.

Englishmen have a deserved notoriety for postponing reforms until a crisis has actually arrived, but the gas industry will be well advised to spare no effort in perfecting the whole of their organization, as the signs of the times show many difficult problems ahead, and in order to cope with them successfully the industry will have to be at its very best. The competition with electricity produced in bulk will be necessarily keener than it has been in the past; and though we need have no fear of the ultimate result, it would be fatal to wait before doing what is possible in order to prepare ourselves for the fight.

Mr. Butterfield's report to the Board of Trade contains five recommendations. The first is harmless. The fourth and fifth have already been discussed in the previous article of this series entitled "Gas Apparatus" (see "Journal" for April 23, p. 231). The second and third raise a question much more far-reaching than probably Mr. Butterfield himself imagined, and it is to be hoped that the gas industry will be very careful before they do decide to support this part of the report.

Finally, we have a Socialist Government in office, though not in power; and it is not too much to anticipate that within a few years we shall have such a Government not only in office but in power, and pledged to the nationalization first and foremost of the public supplies. It will then require every effort of the members of the industry, both individually and collectively, to protect the interests of their shareholders.

Of all the spirits that modern magic has summoned from the resources of Nature for the service of mankind, none is greater than gas—the Spirit of Coal, so well portrayed by Scott in his Wembley poster. The man in charge of the manufacture is the magician who brings it forth, and the man controlling the distribution is he who sends it on its career of usefulness. The responsibility is immense, the opportunities tremendous. Let them see to it that they hand on to posterity a Spirit purer and more disciplined than that which they themselves received from the pioneers of this great industry.

Skin Ulceration affecting Pitch and Tar Workers.

The Chief Inspector of Factories forwards the following information regarding this complaint. Some pitch and tar workers develop small warts or ulcers on the skin of the face, arms, and very frequently in the neighbourhood of the private parts of the body, especially on the scrotum, and it is these that may grow into the serious condition. If a wart or ulcer appears on any part of the skin, medical attention should be sought at once, so that a doctor can advise the proper treatment. All warts or ulcers do not necessarily grow into cancers; but they may do so, and are therefore best removed. This can be done quite simply. There is little fear of cancer developing under ten years of employment and if the worker is under 35 years of age. The only treatment known to be successful at the present time is to remove the growth completely by operation; and therefore the smaller it is the more easily can this be done, and the sooner it is treated the greater the chance of success. Delay may make all the difference between success and failure. Fortunately, the form of cancer which is the most curable by operation, so that it will not recur, is cancer of the skin.

"Coal Carbonization."—This is the title of a new book which we have received from the Chemical Catalog Company, Inc., of No. 19, East 24th Street, New York. The author is Mr. H. C. Porter, M.S., Ph.D. As bye-product coke ovens are the predominating coal-carbonizing devices in the United States, these are described in considerable detail. The volume is published at the price of $6.

Calorific Values Based on Local Conditions.—After an investigation of calorific value standards extending over three years, the Washington Department of Public Works have declared in favour of standards based on local conditions, and have made permanent the temporary order issued four years ago permitting certain gas companies to continue to manufacture gas of a lower calorific value than the 600 B.Th.U. standard formerly in effect. The Department, in their report on the subject, express the opinion that it is not ordinarily practicable or economical to maintain a uniform standard calorific value for gas throughout an entire State. They also find there is no material increase in consumption due to the lower standards, varying from 450 to 530 B.Th.U., as against 600 B.Th.U., and that in the utilization of gas there is practically no difference in efficiency between the two.

Conference of Engineering Societies.—There is to be a second conference of Engineering Societies at the British Empire Exhibition at 10.30 a.m. on Monday, Sept. 15. Of the four short papers which will be presented and discussed, one will be on "Co-operation between the Works Chemist and the Engineer," by Mr. A. R. Page, M.Inst.Met., of the Birmingham Association of Mechanical Engineers, and another on "Technical Popular Fallacies," by Mr. A. S. E. Ackerman, B.Sc. (Engineering), Assoc.M.Inst.C.E. All engineers are invited to take part in the conference. The price of the tickets is 5s. 6d. each, which includes admission to the Exhibition grounds, lunch at 1.30 p.m., and tea at 5 p.m., and they may be obtained from the Secretary of the Society of Engineers, No. 17, Victoria Street, Westminster, S.W. 1.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Carbonizing of Coal in Bulk (Becker Ovens).

SIR,—In your issues of July 30 and Aug. 20 appear two letters under the name of "Simple Simon," in which he takes certain coke-oven yields, and, by constructing weight balances and volatile matter balances, draws a series of conclusions impugning the accuracy of those results. With their accuracy the present writer is not concerned; but the basis of "Simple Simon's" method cannot pass unchallenged.

"Simple Simon" apparently considers that the coke yield on the works should equal the fixed carbon obtained in the laboratory analysis, whereas there is abundant evidence to show that the coke yield is greater by as much as 3 p.ct. to 4 p.ct. Byrom and Christopher in "Modern Coking Practice," Vol. 2, p. 3, show that a coal with 68 p.ct. solid residue in the crucible test would be expected to yield 71 p.ct. in the oven. The authoritative figures of the Fuel Research Board given by the late Sir George Beilby (Trans. Inst. Gas Eng., p. 356) confirm this, in tests A, D, and J., as the following shows:

Test	A.	D.	J.
	P.Ct.	P.Ct.	P.Ct.
Fixed carbon, by laboratory test (dry basis)	73·6	69·2	66·5
Coke yield in retorts (dry basis)	76·2	73·1	67·9
Surplus of coke yield over laboratory test.	2·6	3·9	1·4

The amount of volatile in the coke only accounts for about 0·15 p.ct. of this surplus in the first two tests, and 0·5 p.ct. in the last.

Obviously there is no correspondence between conditions of heating in the laboratory and in the coke-ovens; and any arguments based on this method must be fallacious. Apparently "Simple Simon" has no great faith in his own method when he states that "with good standard practice under ordinary high-temperature oven practice" the coke yield is 63·44 p.ct. or thereabouts. Does he suggest that the average coal used for coking contains 36·56 p.ct. of volatile matter?

"Simple Simon" further constructs a weight balance, and apparently finds that the products total more than the weight of the coal originally added. It is obvious that unless special precautions are taken there is considerable likelihood of this happening. "Simple Simon" needs only to refer to the Fuel Research Board's Report mentioned above, Table 9, to see that in spite of most elaborate precautions, in two out of three of the non-steaming tests, the products were in excess of the original coal, in one as much as 1·44 p.ct. Certainly weight balances which require assumptions of specific gravities, moisture in coal, &c., and which are based on anything except strict test figures, cannot be accepted.

These are matters of important principle. There are, besides, several errors in calculation which render "Simple Simon's" conclusions unreliable.

Aug. 29, 1924. "STUDENT."

Heat Balances and Specific Heats.

SIR,—Anonymous letters are likely to be read carelessly; and as the only advantage of anonymity in technical correspondence is that it permits the writer to be rather more sarcastic, or even spiteful, than he would venture to be over his own name, I do not feel called upon to apologize for misreading "Careful Reader's" letter. But I owe an apology to any of your other readers who have seen my reply, and realized that I missed the mark rather badly. I offer the following study of the subject of the correspondence as an atonement for my mistake.

It is sometimes rather annoying to find that new researches compel one to be continually changing the tables of physical constants which one uses in technical calculations; but such, until recently, has been the state of our knowledge of the specific heats of gases and vapours that anything new is welcome. All technical chemists and engineers will welcome the publication of a work entitled "The Specific Heat of Gases" by Prof. Partington and Mr. Shilling.* It is, to quote from the preface, truly the first coherent attempt to deal with our knowledge of the subject critically. The authors have themselves contributed to our theoretical and practical knowledge of the subject, and their book will undoubtedly be recognized as a standard work of reference. The volume contains numerous tables of the more important related constants, and, among these, values of the mean interval specific and molar heats of the common gases, recalculated on the basis of a thorough survey of our knowledge. The values now put forward do not differ very materially from those contained in a paper which I recently contributed to the "JOURNAL," but I shall adopt them for future use, and do not doubt that they will generally be accepted.

This work also brings out very clearly the paucity of our knowledge of the specific heats of gases and vapours, other than those of hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and steam. The fact is that the whole subject has been seriously neglected. Until quite recently our knowledge of the specific heats of the vapours of such an important series of compounds as the paraffin, olefine, and acetylene hydrocarbons, covered only somewhat doubtful data for methane. Isolated determination of constants for higher members of the paraffin series, and for other hydrocarbons, often showed serious discrepancies. Our knowledge is still very limited, but over a restricted range it is fairly definite.

A recent paper by Dixon and Greenwood ("Proc. Roy. Soc.," 1924, 105, 199) provides valuable information with regard to certain hydrocarbons. From the results published in it, we can obtain the values of the *true* molar heats, and the *interval* molar heats, 0° to t°, for methane and ethane—

True molar heats at t° C.:

Methane . . . . . $8·926 + 0·0182t$,
Ethane . . . . . $10·860 + 0·0182t$,

and for the mean interval molar heats 0° to t°,

Methane . . . . . $8·926 + 0·0091t$,
Ethane . . . . . $10·860 + 0·0091t$,

Isolated values for the molar heats for pentane and hexane are given each at a single temperature—

Pentane . . . . . $t = 86°$ C. .. $Cp = 29·50$
Hexane . . . . . $t = 80°$ C. .. $Cp = 31·36$

If the latter values are reduced to 0° C., employing the temperature coefficient which is common to methane and ethane, we have for the values of the four paraffin hydrocarbons, extrapolated to 0° C.—

Methane . . . . . 8·926
Ethane . . . . . 10·860
Pentane . . . . . 27·85
Hexane . . . . . 29·90

If these values are plotted against the corresponding numbers of carbon atoms in the respective molecules, we find that we can draw parallel lines through the pairs of points corresponding to methane and pentane, and ethane and hexane, respectively. This indicates, as one might expect, that the odd and even members of the paraffin hydrocarbons form separate series. We can use the graphs to obtain an estimate of the molar heats of the paraffin hydrocarbon vapours, extrapolated to 0° C.—

Number of Carbon Atoms in Chain.	Molar Heats of Normal Paraffin Hydrocarbons 0° C.	
1	8·93	
2		10·86
3	18·3	
4		20·3
5	27·85	
6		29·9
7	37·3	
8		39·3
9	46·7	
10		48·6
11	56·3	
12		58

If this process really gives a true estimate of the values which we aimed at obtaining, and if the temperature coefficient is the same for the whole series, the sensible heats of the C_6 and C_{12} members of the series, which we can take as examples, per pound of carbon as hydrocarbon, is given by—

C_6H_{14} . . . . . $(0·415 + 0·0004t)t$,
$C_{12}H_{26}$ . . . . . $(0·410 + 0·0004t)t$.

The total heat loss on cooling and condensation includes the latent heat of volatilization of the hydrocarbons, and the specific heat of the liquids. The former values are taken from Landolt's tables—

	C_6H_{14}.	C_8H_{18}.	$C_{10}H_{22}$.	$(C_{12}H_{26})$.
Per lb. hydrocarbon	81 ..	71 ..	60 ..	(50)
Per lb. carbon as hydrocarbon . .	97 ..	84 ..	71 ..	(58)

The latter are given in "Das Erdöl" (Engler-Hofer, 1913):

—	Per lb. Hydrocarbon.	Per lb. Carbon as Hydrocarbon.
C_6H_{14}	0·507	0·605
C_8H_{18}	0·505	0·600
$C_{10}H_{22}$	0·502	0·597
$C_{12}H_{26}$	0·500	0·590

Practically we can assume a common value 0·6 for the values in the second column.

From these data we can calculate the heat loss on cooling and condensation of the hydrocarbons C_6H_{14} and $C_{12}H_{26}$ from (say) 400° to 0°—

	C_6H_{14}.	$C_{12}H_{26}$.
(i.) Heat loss by cooling—		
$C_{12}H_{26}$ to B.Pt., 200°	..	130 C.H.U.
C_6H_{14} to B.Pt., 80° . .	199 C.H.U. ..	..
(ii.) Latent heat	97 ..	58
(iii.) Heat lost by liquid—		
$C_{12}H_{26}$, 200 to 0°	..	120
C_6H_{14}, 80 to 0°	42 ..	..
Totals	338 ..	308

As a matter of fact, an almost identical result is obtained using the Institution formula for the total heat of tar, which can be written

$$(0·8t + 180) \times 5/(9 \times 0·92),$$

so as to obtain the result in C.H.U. per pound of carbon as tar containing 92 p.ct. carbon. The result obtained is 302 C.H.U., of which 109 C.H.U. represents the latent heat. The agreement is therefore to a certain extent a matter of chance.

Now the average composition of tar approaches to the formula $(CH)_n$, and we have a very limited knowledge of the specific heats of the hydrocarbons low in hydrogen, as solid, liquid, or vapour. Such reliable information as I can find is tabulated below, in terms of specific heat per lb. of carbon as hydrocarbon—

Ethane	15°	0·463	Dixon and Greenwood.
Ethylene. . . .	..	0·443	do.
Acetylene . . .	..	0·37	Partington and Shilling.
Hexane vapour .	80°	0·435	Dixon and Greenwood.
Benzene vapour .	90	0·351	do.
Benzene, liquid .		$0·430 + 0·0004t$	(1)
Anthracene, solid .		$0·296 + 0·00037t$	(2)

(1) Mean of results in Landolt's tables.
(2) Hildebrande, "A. Chem. Soc. J.," *39*, 2293.

* This book was reviewed in the "JOURNAL" for June 25, p. 905.

Generally the less hydrogen the lower the value of the specific heat per pound of carbon, as one would expect to be the case.

In putting forward a formula for the heat loss on cooling and condensation of tarry vapours, one must try and arrive at a formula including the sensible heats of the liquid and vapour, which increase as the range $o° - t°$ increases, and the latent heat of condensation. The above facts appear to indicate that the former will be fairly well represented by—

$$(0{\cdot}35 + 0{\cdot}0004t)t \text{ C.H.U. per pound of carbon as tar,}$$

the latter will not be far from

90 C.H.U. per pound of carbon as tar.

The latter will apply only to the volatile part of the tar, and it must be admitted that it is not easy to make a distinction between the volatile and non-volatile parts, or to decide as to how much of it becomes non-volatile after it is first collected. However, one is aiming at devising a formula which really represents the changes that are taking place sometimes, and not one which fits the facts—sometimes.

The formula which I put forward assumes that the sensible heat component is smaller than the sensible heat component in the Institution formula for values of $o° - t°$ below 350° C., and larger for greater values. However, the difference is very much less than I assumed it to be in my earlier communication.

M. W. TRAVERS.

147, *Queen Victoria Street, London, E.C.* 4,
Aug. 28, 1924.

REGISTER OF PATENTS.

Control of Combustible Gas.—No. 219,059.

HOLMES, G. E., of Ilford, and THE GAS LIGHT AND COKE COMPANY, of Horseferry Road, S.W. 1.

No. 8537; March 26, 1923.

This invention, say the patentees, is particularly concerned with the preparation of gas such as is supplied for public service, but is not limited to this use as it is also applicable to the preparation of other combustible fluids. The invention has for one of its objects to provide for the heating value of the combustible material to be controlled, for example for it to be maintained constant.

The specification describes the application of the invention to, and apparatus for, delivering a mixture of coal gas and water gas of a predetermined regular heating value. This is effected by "regularly delivering a measured supply of the prepared material to a burner arranged in operative relationship to a calorimeter, burning the supply, and automatically varying the composition of the material by changing the relative proportions of its constituents according to variations in the calorimeter readings."

The features and details of the invention and two forms of apparatus are fully dealt with in the specification; and in the following we briefly indicate the principle on which it works, in connection with a reproduction of the first diagram.

Coal gas reaches the pipe A from a conduit B, and water gas from a pipe under the control of a valve C. The setting of C, and consequently the relative proportions of coal gas and water gas, is controlled by a bell float D. The latter is operated by the admission or withdrawal of gas through a pipe which leads to a slide-valve E. In operation a sample of the gas under supply is taken from the pipe A, corrected by pressure regulators F and G, also corrected by a density-controlled member H and then burnt in a calorimeter J. Any variations in the amount of heat which it gives off operates the capsule K to vary the setting of the slide-valve E; and thus increases or exhausts the pressure in D. Movements of the calorimeter capsule are recorded at L.

Coking Retort Ovens.—No. 211,817.

BECKER, J., of Pittsburgh.

No. 11,602, April 30, 1923. Convention date, Feb. 23, 1923.

This invention relates to coking retort oven batteries having side by side coking chambers with intermediate heating walls and reversible regenerators.

In a previous specification (No. 171,117) is described such a battery in which heating walls are operatively disposed in pairs, and the two heating walls mutually paired on the opposite sides of an intervening coking chamber have gas flow connections only with each other and their respective regenerators, and so constitute a separate unit for the regenerative flow of the heating gases.

The present invention has for its main object to provide a modification of the regenerator system of a battery employing its own gas as fuel and comprising a plurality of separate units as stated, which will ensure a more uniform and efficient distribution of heat. The invention consists in the arrangement that one heating wall of a pair communicates with a single air-preheating regenerator, or with a plurality of such regenerators arranged end to end, while the other heating wall of the pair communicates with a single waste-heat receiving regenerator or with a plurality of such regenerators arranged end to end.

By this arrangement the flow of heating gases in the heating walls and regenerators of each separately functioning unit takes place longitudinally of the battery as in the case of the prior construction referred to, but without the division of the flow into two streams.

Adsorbent Materials.—No. 219,352.

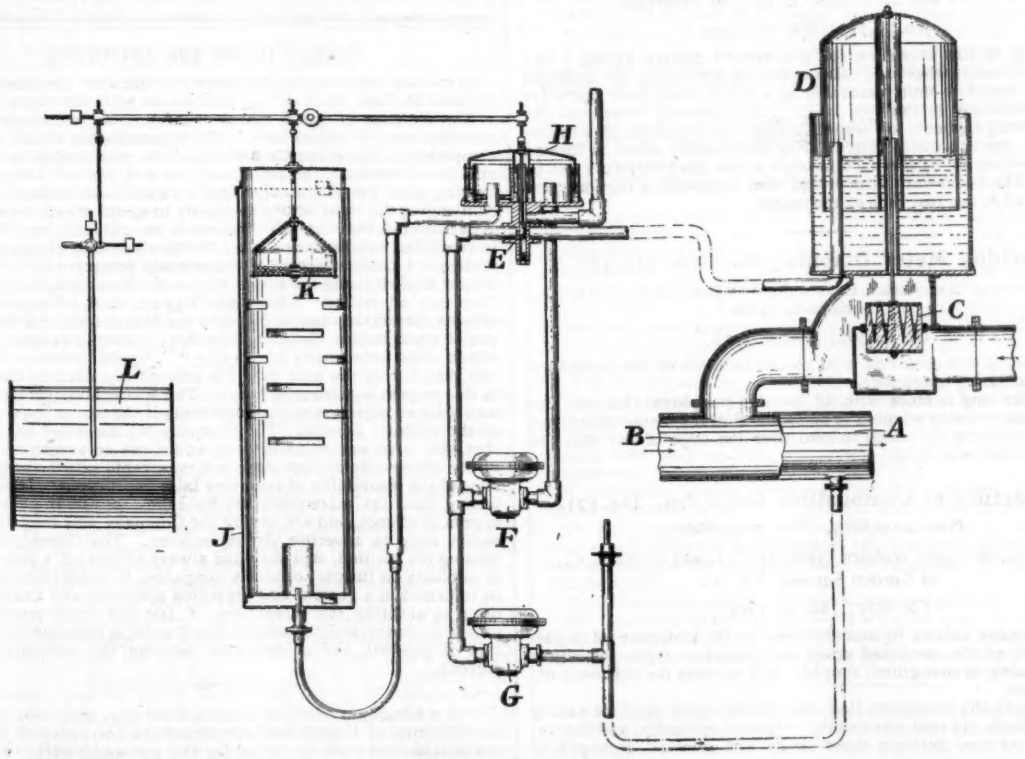
SOMERVILLE, P. G., of Buckingham Gate, S.W. 1, and WILLIAMS, E. C., of Huddersfield.

No. 5309; Feb. 23, 1923.

This invention, relating to adsorbent material and their manufacture, provides for the preparation of silica gel by the hydrolysis of a silicon compound in substantial absence of a soluble base (such as soda), and drying at a raised temperature.

In a preferred form of the invention, silicon chloride is poured into water with vigorous agitation. A firm gel is formed very rapidly by adding 12 p.ct. of the chloride by volume. If less chloride is added, the mixture sets to a gel on standing. It is preferred to use 8 to 9 p.ct. of silicon chloride by volume, when the mixture sets to a firm gel in 2 to 6 hours. The gel is washed and then carefully dried at 100° C. with heat (though it may be dried direct (without washing) if desired), the drying lasting 12 to 24 hours. The temperature may then be slowly raised to 400° C. Care is taken not to destroy the microstructure of the gel, thus affecting its adsorptive properties.

The product is practically free from alkali salts such as sodium chloride or sulphate—traces of such salts are undesirable since they tend to accelerate crystallization of the amorphous silica. Hence the gel obtained can be heated to a higher temperature without destroying its adsorptive properties—*e.g.*, up to 900° to 1000° C.



HOLMES CONTROLLER.

Gas Burners for Cooking.—No. 219,146.

SOUTH METROPOLITAN GAS COMPANY, and CHANDLER, D., both of Old Kent Road, S.E. 15.

No. 16,181; June 21, 1923.

According to this invention for gas burners suitable for use in cooking, the body of the burner is bored out to receive a plug (preferably a loosely sliding fit) provided with a plurality of grooves forming channels for the gas from an injector tube; the channels being of at least such length as to overcome the tendency to back-fire. The upper end of the plug is provided with a flange adapted to rest upon the top of the body of the burner, the channels extending into the flange at right angles. The bottom of the plug is rounded so as to lead the mixture to the channels and to reduce eddying; and the body of the burner and the plug are so arranged that the area of the chamber below the plug is small.

In an alternative arrangement the body, instead of the plug, is provided with the channels.

Taps for Geysers.—No. 219,241.

EWART, J. H., of Hazlemere Road, N. 5.

No. 32,218; Dec. 22, 1923.

In geysers with interlocking gas and water taps it has been found that in course of time the position of the spanner of the water tap, when turned off, varies from its original position owing to wear of the washer of the tap, thereby allowing the gas tap to be turned before the water supply has been turned off.

The object of this invention is to obviate this disadvantage; and the patentee provides for fine adjustment of the spanners of the taps relative to the valve spindles, by forming them with circular holes having internal serrations or teeth engaging with similar serrations on the valve spindles.

Coin-Freed Mechanism.—No. 219,252.

SMITH, E. W., and SMITH METERS, LTD., both of Kennington Park Road, S.E. 11.

No. 3140; Feb. 6, 1924.

This invention relates to coin action of the kind wherein one edge of the coin engages the inside of the case containing the gear and the other edge a depressible lever adapted to engage in teeth or slots in the periphery of the operating wheel.

The lever is in the form of a pocket, and is adapted to receive the coin at a right angle in relation to the direction of movement of the lever; in other words, the coin is inserted in a direction parallel, or substantially parallel, with the axis on which the lever, or "swinging coin table," moves. The invention also includes an improved form of toothed wheel having sloping or saw-edged teeth and on a boss with a friction washer.

The swinging coin table is of substantially U or V shape, and is adapted to receive the coin between its two arms or sides. The inside of the base of the U or V may be fitted with filling pieces of different sizes, so that the device can be used with coins of varying diameters.

Prepayment Mechanism.—No. 219,267.

FOX, T., and ROBINSON, S., both of Liverpool.

No. 11,773; May 10, 1923.

According to this invention for prepayment meters having a cup casing, the quantity wheel and valve operating mechanism are arranged to form a complete unit removable as a whole from their operative positions relatively to the cup casing. The quantity wheel and the valve operating elements are mounted in operative position on a framework; and the cup casing surrounding the quantity wheel is formed with an aperture in its rear face through which the framework can be inserted. The framework is provided with outstanding lugs adapted to be secured to the rear face of the casing.

Attaching Meter Diaphragms.—No. 219,451.

METERS, LTD., of Manchester, BERRY, J., of Oldham, and FOWLER, R., of Thornton-le-Fylde.

No. 14,567; June 2, 1923.

The object of this invention is to ensure isolation of the diaphragm skin from soldering operations.

The carrier ring is made with an annular peripheral channel; one side of the latter being adapted to be soldered to the meter casing, and the other having a lip which is bent over the edge of the skin and retains the usual wire ring.

Manufacture of Combustible Gas.—No. 219,471, No. 219,865, No. 219,866.

MOORE, S., of Upper Woburn Place, W.C. 1, and HUNTER, C., of Gordon Square, W.C. 1.

No. 2892; Jan. 31, 1923.

This invention relates to modifications in the structure of a gas-making plant of the combined retort and generator type; the object (*inter alia*) being to strengthen, simplify, and increase the efficiency of, the apparatus.

According to the invention, that part of the outer shell or casing which surrounds the coal gas retort is tapered upwardly, and the regenerative chamber between outer casing and retort is arranged in spiral form.

The patentees point out that a spiral flue or passage surrounding a coal distilling retort is not new *per se*, and they do not lay claim to its application to gas-making apparatus generally.

Further, the interior of the spiral regenerative chamber is advantageously of stepped form; the steps serving as baffles to ensure a more or less tortuous passage of the hot blow gases, which results in very efficient and even heating of the retort.

No. 30,169; Jan. 31, 1923.

This specification describes and claims a method of charging the retort. It consists in delivering the coal in a plurality of inwardly and downwardly directed streams into the sides of the retort at points below the top. It is claimed that thereby the smaller coal builds up round the sides of the retort, and the larger pieces form a relatively porous column towards the centre, and a clear space or zone is left in the upper part of the retort above the coal body.

The shoots which enter the sides of the retort are provided with hoppers each comprising an upper and a lower chamber closed off from each other by an externally operable gas-tight valve. Means to admit fuel to the upper chamber of the hoppers are described.

No. 30,170; Jan. 31, 1923.

In this specification the patentees describe and claim an arrangement for supporting the fuel column and for discharging coke or ash, comprising a sealed receiving chamber located below the open lower end of the water gas generating chamber, which latter narrows downwardly in cross-sectional area to a relatively restricted discharge opening, and a reciprocating platform or grate arranged somewhat below the opening and formed with a downward slope towards each end from a central ridge; this platform or grate extending longitudinally beyond the edges of the discharge opening.

Claim 2 is for a circulating chamber or passage located in the wall of the lower portion of the water gas generating chamber, and opening thereto through a plurality of ducts or tuyeres spaced apart round the said chamber, means to supply air and steam under pressure to said circulating chamber or passage, and means to conduct gas therefrom, whereby heat is imparted to the walls of the passage by the outgoing gas, and absorbed from the walls by the incoming steam or air.

A steam superheater is located in the waste-gas exhaust pipe.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Aug. 27.]

Nos. 19,504 to 20,004.

DORGELO, J. I.—"Determining calorific value of gases." No. 19,896.
EVANS, E. C.—"Production of coke." No. 19,653.
GEIPERT, R.—"Apparatus for manufacture of generator or producer gas." No. 19,814.
JOBSON, F. J.—"Gas furnaces for ovens, &c." No. 19,545.
KENT & Co. (Globe Works), LTD.—See Jobson, F. J. No. 19,545.
LAING, B.—"Distillation of carbonaceous materials." No. 19,769.
METERS, LTD.—"Prepayment gas-meters." No. 19,931.
NIELSEN, H.—See Laing, B. No. 19,769.
ORME, T. A.—See Meters, Ltd. No. 19,931.
STANSFIELD, A.—See Meters, Ltd. No. 19,931.
SULZER FRÈRES STÉ. ANYE.—"Tar distillation apparatus." No. 19,703.
TAYLOR, W. MARTIN-.—"Gas-fired water-heaters, &c." No. 19,657.

Public Utilities and Advertising.

A curious case and a commonsense decision are reported in the "American Gas Journal," in connection with the right of a public utility company to spend money on advertising in newspapers. This question was put to the Public Utilities Commission of Connecticut; the complainants being the City of Stamford, represented by the Mayor, and the defendants the Stamford Gas and Electric Company. The hearing arose out of a petition filed with the Commission by the Mayor challenging the right of the Company to spend money on advertising. It was stated that the advertisements in question were educational in character, and explained the Company's system of charging for gas service. A curious feature of the case was presented by the fact of the Mayor himself being the owner of one of the newspapers in which the Company advertised. Chairman Higgins, of the Connecticut Commission, heard the case, and to him the Mayor said: "The people ask you to stand behind them in their fight against a grasping monopoly which does unnecessary advertising." Inquiry, however, elicited the fact that during the past year the amount expended by the Company in this respect totalled only $1290. The Mayor said, further, that there would be no objection to the advertising if the cost of it were taken out of the officers' salaries. The Company, on the other hand, realizing that this is an era of advertising, could see no reason why a public utility concern should not do it to a reasonable extent—particularly in view of the desirability of removing false impressions. In fact, people having read the advertisements have now begun to understand the system of charge, and are asking the Company why they did not take earlier steps to advertise the explanation. The Commission, in dismissing the petition, said they had always advocated a proper amount of publicity on the part of utility companies, in order that people might be informed in a general way regarding operating and financial conditions as affecting the ratepayers. A fair and frank statement by a utility on controversial questions would assist in maintaining a relationship of goodwill and co-operation between the company and their patrons.

At a meeting of the Colne Council on Aug. 28, it was stated that the Ministry of Health had sanctioned the borrowing of £10,000 for the provision of working capital for the gas undertaking, and a loan of £7000 for the reconstruction of the purification plant at the gas-works.

MISCELLANEOUS NEWS.

WEMBLEY AT EASTBOURNE.

Eastbournians are very proud of their annual flower show, which for more than fifty years has been the great event of the year. Thanks to the generous hospitality of successive Dukes of Devonshire, it found a home in the beautiful grounds of Compton Place, until the war came and put an end to its activities. A few days ago, the show was resuscitated, and was held in the lovely grounds of the Old Manor House, where for ages the Lords of the Manor have lived and died. Eastbourne does these things well, and the collection of flowers and fruits was as magnificent as ever.

Two of the large marquees, however, had little to do with flowers and fruits. One of them was occupied by a number of electric cookers, with which a lady demonstrator and others endeavoured to illustrate the advantages of electricity over gas in the kitchen.

The other marquee contained a really excellent series of tableaux arranged by the Eastbourne Gas Company. The exhibit was a replica of the beautiful show at Wembley, designated as the "Seven Ages of Woman." A dozen clever girls from the local Cookery Centre of the Elementary Schools did their work splendidly. Every kind of gas apparatus was on view amid appropriate surroundings, and the whole show was voted by everybody a huge success. There were at times queues nearly a hundred yards in length, patiently waiting to pass through the marquee—the visitors actually exceeding 10,000 during the two days. Much useful literature was distributed, and without doubt some splendid propaganda work was done.

TAUNTON GAS LIGHT AND COKE COMPANY.

A Satisfactory Year.

The seventy-ninth annual report, which was adopted by the shareholders at the meeting last week, stated that the quantity of gas sent out during the past year had been 172,838,100 c.ft., an increase of 11·2 p.ct. over the preceding twelve months. The amount available was £5486, and the Directors recommended dividends for the year ended June 30 at the rates of 5 p.ct. on the 1897 preference stock, 7 p.ct. on the 1920 redeemable preference stock, 9 p.ct. on the consolidated "A" stock; 7⅞ p.ct. on the yellow shares, and 7⅞ p.ct. on the new (1897) ordinary stock. These dividends would absorb £3405 for the second instalment, an interim dividend having already been paid.

Mr. ROBERT BRUFORD (who presided) said that the continued increase in the gas output was due no doubt partly to the fact that the Company had an excellent sales staff, and also to the fact that they were supplying a good article. The number of appliances fixed during the year was something like 2000, which was a record for the Company. For the first time since the war, it had been possible for them to put in prepayment installations, for which they had had a great demand. Wages were costing about three times what they did pre-war, consequent upon the higher rates, shorter hours, and the amount of extra work on hand; but this was in some degree counterbalanced by the installation of modern retorts, credit in which connection was due to their Manager (Mr. C. Harris). The net cost of coal (less residuals) was no more than was the case previous to the years of the war, notwithstanding a 50 p.ct. increase in the quantity of gas sold, and the cost of coal being higher. In spite of the increase of 11 p.ct. in the quantity of gas sold during the past year, £1480 less had been received, owing to a reduction of about 6d. per 1000 c.ft. in the price. This showed that they were passing on to the consumers as much as possible of the benefit derived from modern machinery and good management. The work in hand included a 500,000 c.ft. holder, new purifiers, and additional water gas plant. Referring to the death of their former Engineer and Manager (Mr. A. Edwards), who did so much to start the undertaking on its successful career, the Chairman remarked that Mr. Edwards was a hard-working, conscientious, and upright servant, and no one felt his loss more than did the Directors of the Taunton Gas Company.

The Chairman and Directors were thanked for their services, as were also the Manager and staff. The Chairman said that Mr. Harris was the heart and soul of the business. He had practically remodelled the works, and the Company were to-day in an even stronger financial position than when he came to Taunton.

At a subsequent extraordinary general meeting, a resolution was confirmed authorizing the establishment of a co-partnership scheme.

Burnley's New Gas-Works.—In connection with the proposed new gas-works at Old Hall, the Burnley Corporation have arranged for the Borough Surveyor (Mr. Race) to take charge of the drainage, roads, and building work, and for the Gas Engineer (Mr. J. H. Clegg) to supervise the construction of plant, machinery, and mains.

Hastings and St. Leonards Gas Company.—An increase in the quantity of gas sold of 7·03 p.ct. when compared with the corresponding period of the previous year is reported by the Directors of the Hastings and St. Leonards Gas Company for the six months ended June 30. The accounts show a balance of £12,923, out of which dividends for the half-year, less income-tax, are recommended at the rates per annum of £6 15s. p.ct. on the 5 p.ct. converted stock, £5 5s. p.ct. on the 3½ p.ct. converted stock, and £6 4s. 6d. on the 5 p.ct. additional stock. Mention is made in the report of the severe loss sustained by the Company through the death of Dr. G. G. Gray (the Chairman) and of Mr. E. R. Mansell (a Director). Mr. W. J. Glenister is the new Chairman, and Mr. H. H. Moffett and Mr. A. W. Oke have been appointed Directors. As from April 1 the price of gas was reduced to 11½d. per therm. At the forthcoming meeting a resolution will be submitted authorizing the acquisition of the undertaking of the Battle Gas and Coke Company, Ltd., at a price not exceeding £4750.

BARNET DISTRICT GAS AND WATER COMPANY.

A Progressive Undertaking.

The Ordinary Half-Yearly General Meeting of the Company was held on Monday of last week, at the London Offices, No. 139, Cannon Street, E.C.—Mr. WILLIAM CASH, F.C.A., presiding.

The SECRETARY (Mr. E. D. Davey, A.C.A.) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

The CHAIRMAN said that, before he dealt with any other business, he wished to refer to the great loss which the Company had sustained through the death of Mr. Arthur F. Phillips, who had presided at their last half-yearly meeting. He was a Director for twenty-three years, during nearly ten of which he occupied the position of Chairman. His eminent qualifications for such a position were well known to all of them. Both the Board and the shareholders much regretted his death. The Board had done him (the speaker) the honour of asking him to become a Director, and the still greater honour of inviting him to take the chair. Of course, he had not yet had the opportunity of acquiring that intimate knowledge of the undertaking which the late Chairman possessed, but he had learned sufficient to appreciate the fact that the Company had a very valuable property. So far as he could see, the business had been excellently managed in the past, and he would do his best to continue in the same way.

Proceeding to move the adoption of the report and accounts for the half-year ended June 30, the Chairman pointed out that the sales of gas in money showed a small decrease of about £600, but this was accounted for entirely by the fact that the price during the half-year had been 11d. per therm, as compared, a year ago, with 1s. 1d. up to March, and 1s. from then until June. Had the price been the same as in the corresponding period, it would have meant an increase of receipts of £4300, which was a very substantial concession to the consumers. Further, the Directors had decided to again reduce the price as from September from 11d. to 10·5d. per therm. In quantity the gas sold during the period under review showed an increase of 11·69 p.ct. over the previous year. The return from residuals worked out at 65 p.ct. of the cost of the coal, which was good testimony to the excellence of the working. The net price for coal, calculated per 1000 c.ft., was about 1d. more than in the corresponding half-year. Rates and taxes exhibited a very substantial increase, owing to the fact that the gas undertaking had been re-assessed. The Directors had taken steps in this matter, and there was an appeal pending, through which the Company might get some relief. Water revenue receipts were up by £2300, or an increase of 6⅝ p.ct. On this occasion the Directors were proposing a slightly different allocation of the surplus profits. They were transferring £2500 to the contingency fund account, and had opened for the first time in the history of the Company a reserve fund, to which they were also putting £2500. The balance to be carried forward would be slightly less than the amount brought in, but with a growing business such as theirs they need not trouble about this. The capital account remained over-spent, but surplus funds in hand not specifically invested were used to meet this. Although there was nothing in this respect that called for their attention at the moment, it was quite evident that, with both departments growing as they were, the time was not far distant when the Board would have to face further capital expenditure. They had the necessary land available for retort-house extensions. Work was in hand at the various stations to ensure the maintenance of an adequate supply of water. As they were aware, Mr. F. J. Bancroft, B.Sc., M.Inst.C.E., had retired from the position of Engineer, and had been succeeded by Mr. J. F. Haseldine, M.Inst.C.E., with whose services the Board were well satisfied. Mr. Haseldine had certainly put his back into the work of the Company, and the Directors had every confidence that he would fully maintain the traditions of the undertaking. Their Secretary, Mr. Davey, belonged to a firm who were specialists in the business of gas and water undertakings, so that the Company might regard themselves as being singularly fortunate in their officers.

The DEPUTY-CHAIRMAN (Dr. J. W. L. Glaisher, F.R.S.) formally seconded the motion, which was carried unanimously without discussion.

On the proposition of the CHAIRMAN, seconded by Mr. COLIN DOCWRA, the meeting agreed to the declaration of the full statutory dividends for the half-year ended June 30 at the rate of 10 p.ct. per annum on the "A," "B," and "C" stocks and 7 p.ct. per annum on the "D" capital gas and water stocks—all less income-tax.

The CHAIRMAN said it appeared that at the last half-yearly meeting a resolution was proposed and carried increasing the Auditors' fees to 150 guineas per annum as from that date, but there was some doubt expressed as to whether the motion was entirely in order having regard to the fact that no intimation of it appeared in the notice convening the meeting. Therefore the Directors had considered it better that the resolution should be brought forward again that day, after proper notice had been given, and that the increased remuneration should date back to Feb. 25, as was the original intention of the proprietors.

A resolution to this effect was formally proposed by Mr. F. R. SMITH, seconded by Mr. E. A. PIERCE, and carried unanimously.

On the proposition of the CHAIRMAN, seconded by Mr. SMITH, a hearty vote of thanks was passed to the Engineer, Secretary, officers, and workpeople for the good services rendered by them during the past half-year.

Mr. HASELDINE and Mr. DAVEY acknowledged the vote.

Mr. CHARLES CHAMBERS proposed a similar vote to the Chairman and Directors, which was seconded by Mr. PIERCE, cordially endorsed by the meeting, and briefly acknowledged by the CHAIRMAN.

St. Columb Gas-Works Company, Ltd.—The Company have declared a dividend of 7½ p.ct. free of income-tax, and have reduced the price of gas, as from June 30 last, 6d. per 1000 c.ft. to ordinary consumers and 4d. to prepayment meter users.

GLOUCESTER GAS LIGHT COMPANY.

Further Capital to be Raised.

The statement of accounts submitted at the half-yearly meeting of the Company on Monday of last week showed a profit of £8800.

The Directors in their report said the figures indicated very successful working for the half-year, resulting in an increased gas consumption of over 15 million c.ft. The sale of residual products had also been satisfactory. Anticipating a further increase in output, they had announced a reduction in the price of gas from 9·032d. to 7·742d. per therm (from 3s. 6d. to 3s. per 1000 c.ft.), to take effect after the reading of the meters for the September quarter. This would mean a saving to the consumers of £11,500 a year. It was more than was justified by the revenue account, but the financial position of the Company enabled them to forestall the future with confidence. They recommended the payment of the maximum statutory dividend of 5 p.ct. per annum for the half-year (less income-tax) upon the consolidated stock. A large amount of capital had been expended during the last few years in the laying of additional mains, and to maintain a sufficiency of pressure at the extremities of the area of supply. The capital of the Company had already been overspent by £20,746, and the Board proposed to raise further money during the ensuing autumn.

The Chairman (Mr. J. H Jones), in moving the adoption of the report and accounts, stated that there were very few gas companies or corporations selling at the present Gloucester price, and far fewer at less than that. The Directors considered the Company might be reckoned one of the safest in existence. The dividend of 5 p.ct. was not a large one, but it might be depended upon to continue, as it had for many decades, without question.

The report and accounts were adopted.

TRADE NOTES.

Welsbach-Kern Gas Radiators.

From the Welsbach Light Company, Ltd., of Gray's Inn Road, W.C. 1, we have received a copy of their new Welsbach-Kern radiator catalogue. It is certainly an excellent production; and apart from the admirable way in which the information is presented, the three-colour cover is splendidly executed. In addition the firm have published a booklet and folder descriptive of the same product, and designed in a most attractive way.

Hans Renold Chains.

In consequence of the continued popularity of their chains, Messrs. Hans Renold, Ltd., of Burnage Works, Didsbury, Manchester, are enabled to announce further reductions in prices for the 1924-25 season. These reductions are being made without any change in the high quality for which the name "Renold" has always stood. They have been rendered possible by improved manufacturing methods, and the constantly increasing volume of business.

"Gunfire" Controllers.

Reference was made in the "JOURNAL" a fortnight ago to a useful motor road map prepared by the Automatic Light Controlling Company, Ltd., of Bournemouth. This map is so arranged as to show the extent to which the firm's "Gunfire" controllers have been adopted throughout the country, but in the marking of the map one or two places have unfortunately come to be inadvertently included which should not have been. In York, where another make of controller has been adopted, there are only a very small number of the "Gunfire" pattern; and there are none at all in Earl Shilton, Leicestershire, where, also, another make is used.

"Classic" Grates.

The issue of a new season's catalogue by John Wright & Co., is always welcome, and the forthcoming publication of their latest "Classic" grate list is certain to prove of interest. This booklet—an advance copy of which has been sent to us—demonstrates clearly the excellent style of John Wright's designs, and emphasizes the consistently high standard of value maintained. Brought prominently to the front are the new models "Swastika" and "Zodiac" which are now included in the "Classic" series. The richness of the colour-finishes of the "Classic" grates has long been recognized; and we note that the selection has been enlarged by the addition of three new finishes—golden brown, apple green, and tea-pot brown. The letterpress is comprehensive, while the cover is both original and appropriate. Those who wish to familiarize themselves with these new "Classic" grates, are invited to write for a copy of this booklet to Department "A," Messrs. John Wright & Co., Essex Works, Aston, Birmingham.

Forgetting to Light the Gas.—A verdict of "Death by misadventure" was returned by the Coroner's Jury who inquired into the circumstances attending the death of Frank Hilliger, a furrier of Tottenham, who was found dead from poisoning by coal gas, which was issuing from a boiling ring. A son said that he had known his father on previous occasions to turn on the supply to the ring and forget to light the gas.

Public Primary Schools' Stoves.—In Wellington (New Zealand) there are three centres at which girls in the higher standards at schools receive instruction in cookery and domestic science. For the past seventeen years continuous instruction has been given, and much benefit to the community has resulted. A short while ago it was felt that the gas stoves, which had done such good service, had outlived their usefulness. When the position was explained to the Wellington Gas Company, the management generously donated three up-to-date Richmond "Bungalow" gas cookers, and installed them free of cost. The School Board are naturally delighted with this gift, which is the first of its kind in connection with the manual training classes in Wellington. No conditions were imposed by the Gas Company.

NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

At the beginning of the past week there was a distinct further weakening in the market position, especially as regards Durham unscreened coal. The better quality gas coals held their own fairly well; but seconds and ordinary steams weakened appreciably. The ascertainments regulating wages in September were issued at the week-end, and, as was expected, both shared a reduction to the minimum. Indeed, the actual results were several points below. This, however, means a reduction in costs of only a few pence per ton, and will not relieve the position to any appreciable extent.

Nothing is being done in the way of forward contract business, and prospects for the remainder of this year, as well as further ahead, are at present of the worst. Indeed, as far as prompt business is concerned, it is hardly a question of what sellers make the price. The business simply is not there.

Best gas makes quote 22s. to 22s. 6d., and Wear Specials 23s. Other qualities are nominally 18s. to 19s., with fierce competition for any odd orders.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

There is very little improvement in the demand for Yorkshire and Lancashire coal generally; but the trade in domestic qualities is slightly better. More inquiries are forthcoming from the Continent; but little, if any, business is being done. Buyers appear to be testing the market as to prices in view of competition from Germany.

The demand for gas coal is a little better than usual at this period of the year, probably because of the unseasonable weather. There are stocks at the collieries, particularly of gas nuts; and so long as industries remain stagnant, the position will not improve to any considerable extent. Screened gas coal is 21s. to 22s.; gas nuts, 19s. to 20s. for contract; and "spot" lots can be bought as low as 16s. to 16s. 6d. per ton at the pit.

Prices at Hull at the week-end were:—Bunkers: Yorkshire, Derby, and Notts large screened steam, f.o.b. Humber ports, 20s. to 21s. per ton. Cargo for export, f.o.b. usual shipping ports: Best Yorkshire hards, association, 24s. 3d.; Derby best hards, 25s. to 25s. 6d. West Yorkshire Hartleys, 19s. to 22s. 6d.; South Yorkshire washed doubles, 20s. 6d. to 21s.; singles, 19s.; dry doubles, 17s. to 18s. 6d.; South Yorks washed smalls, 16s. to 16s. 3d.; Derby slack, 1 in., 14s.; South Yorks rough slack, 14s. 6d.; gas coke, 35s. to 36s. 6d.; foundry furnace coke, 26s.; washed smithy peas, 22s. 6d. to 27s.; washed steam thirds, 20s.; South Yorks washed trebles, 21s. 6d. per ton.

Prices in Lancashire have not altered much. Best house coal, 34s.; industrial unscreened, 22s.; slacks, 13s. to 16s. per ton at the pits.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

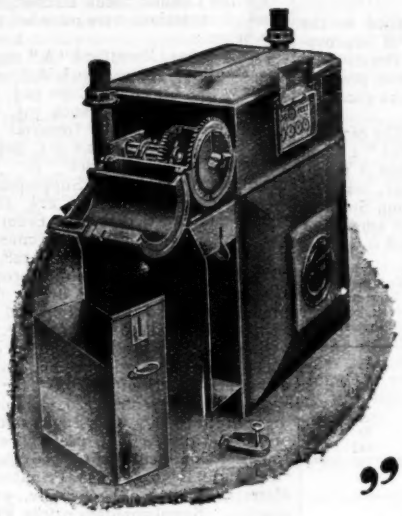
The activity of the house coal trade is keeping the pits in Staffordshire and Warwickshire in steady operation. Most of them are working full time. Values in the Birmingham area are firm. Some disorganization is threatened in the works fuel department by the strike in the Sheffield steel trade. This is forcing a number of Derbyshire collieries to seek alternative outlets for their production, even though the transport charges to districts beyond the ordinary radius of distribution involve some sacrifice of pit-head prices. There is a freer circulation of private owners' wagons. Transport facilities leave something to be desired in one or two directions, but the worst effects of the shortage of rolling stock have been overcome for the time being.

Supplies of industrial fuel are more than equal to the current demand. Electricity works are beginning to take larger deliveries of slack, and requirements for central heating help to absorb the relatively large output. Nuts and beans have a firm tendency, though there is no quotable change in prices.

The pig-iron industry does not develop any more strength, so that stocks of blast-furnace coke are accumulating. There are, however, indications of quickening activity at some of the foundries. Stringency still characterizes the gas coke market, and prices are disproportionately high.

Cork Gas Consumers' Company.—The ordinary general meeting of the Company was held on Aug. 29. Mr. W. B. Harrington (Chairman), who presided, said that, though there had been a slight increase in the quantity of gas sold, owing to two reductions in price made during the year, there was a fall in the receipts. The residuals had yielded a satisfactory return. After placing £457 to credit of depreciation fund, the balance of profit and loss was £4386. A dividend at the rate of 8 p.ct. was declared. The Chairman drew attention to the scheme for promotion of a more efficient use of gas cookers. Prizes had been awarded to schoolgirls who showed most proficiency in their use; and this had aroused great interest.

Aberystwyth Gas Company.—The Directors are able to present a very satisfactory statement of accounts for the half-year ended June 30, which fact is particularly pleasing to them, as affording justification of the bold step taken by them at the commencement of the year in reducing the price of gas to the low figure of 10d. per therm. The balance of profit (£1485) enables them to authorize payment of dividends at the following rates per annum: On the original shares, 15 p.ct.; on the new shares, 10½ p.ct.; and on the preference shares, 5 p.ct. There will remain a balance to carry to reserve of £133. A new gasholder is in course of erection. Mr. David J. Evans has been appointed Secretary in succession to Mr. W. J. Fearnsides.



The "Victory"

PREPAYMENT METER

WITH

PLATE PRICE CHANGER.

OUTSIDE VALVE BOX.

EVERY PART INTERCHANGEABLE.

MADE BY

THE PIONEERS

OF THE SLOT METER,

SAWER & PURVES

(BRANCH OF METERS LIMITED),

MILES PLATTING, RADFORD ROAD,

MANCHESTER. NOTTINGHAM.

45-47, Westminster Bridge Rd.,

LONDON, S.E.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Sept.* 1.

In the London tar products market pitch continues inactive, and in the absence of definite business the price is more or less nominal at 57s. 6d. to 60s. per ton. Creosote is a quiet market at about 6¼d. to 6½d. net per gallon in bulk at makers' works. Pyridine is in good demand at about 20s. per gallon. Pure benzole is about 1s. 9d. per gallon, pure toluole about 1s. 10d., and 95-160 solvent naphtha about 1s. 6d. to 1s. 7d. per gallon.

Tar Products in the Provinces.

Sept. 1.

The market for tar products has remained quiet throughout the past week, and there is very little business doing in any article. There has been more inquiry for pitch, but no sales of importance are reported. Creosote appears to be a little steadier, and more business has been done during the past week for both home and export trade.

The average values for gas-works products during last week were: Gas-works coal tar, 39s. to 44s. Pitch, East Coast, 55s. to 57s. 6d. f.o.b. West Coast—Manchester, 50s. to 52s. 6d.; Liverpool, 51s. to 52s. 6d.; Clyde, 52s. to 55s. Benzole 90 p.ct., North, 1s. 5d. to 1s. 6d.; crude 65 p.ct. at 120° C., 1s. to 1s. 1d. naked at makers' works; 50-90 p.ct., naked, North, 1s. 8d. to 1s. 10d. Toluole, naked, North, 1s. 5d. to 1s. 6d., nominal. Coal tar crude naphtha in bulk, North, 7¼d. to 8d. Solvent naphtha, naked, North, 1s. 4d. to 1s. 5d. Heavy naphtha, North, 1s. 2d. to 1s. 3d. Creosote, in bulk, North, liquid, 5½d. to 5⅝d.; salty, 5d. to 5¼d.; Scotland, 5d. to 5¼d. Heavy oils, in bulk, North, 9d. to 9¼d. Carbolic acid, 60 p.ct., 1s. 10d. to 1s. 11d. prompt. Naphthalene, £15 to £16; salts, £6 to £8, bags included. Anthracene, "A" quality, 4d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

Nottingham Contracts and Municipal Procedure.

An animated discussion took place at a recent special meeting of the Nottingham City Council, relative to the bearing of the judgment of Mr. Justice Bailhache in the Leeds case of *Lapish v. Braithwaite* upon procedure in regard to municipal contracts, a proposal being submitted by Mrs. Shepherd, a lady member representing a large industrial constituency, in favour of setting up a committee to investigate fully as to the various firms with which members of the Council were connected or had been connected during the preceding five years, and the amounts paid to them during that period, and to inquire whether certain members of the Council, who were specifically named in the resolution, had, during the time mentioned, been connected with firms that had directly or indirectly traded with the Corporation. This was met by a resolution, which had precedence, proposed by Sir Albert Ball, which declared that, in view of the decision in the Leeds case, no contract or order of any description for work or material should be placed by the Council with any company or firm in which any member of the Council, or Corporation official, was or might be interested as a director, manager, or official, or with any private limited company of which he was a shareholder. Before this was moved, however, Mrs. Shepherd asked the Town Clerk whether or not, in view of the ruling in the *Lapish v. Braithwaite* case, those members who held directorships in companies with which the Council had done business were not automatically unseated. The official's reply was in the negative. There was a further proposal submitted by Alderman Sir Bernard Wright; and this was ultimately adopted. The proposal declared that, in view of the Leeds case, the Council adhered to its attitude on the question of Corporation contracts or employment, which was that the laws enacted by Parliament should be strictly complied with. The proposal for setting up a committee of inquiry was supported by only three members.

Barnsley Gas Company.—Presiding at the annual meeting of the Barnsley Gas Company last Friday, Mr. E. G. Lancaster (Chairman of the Directors) remarked that both the income and expenditure were very much the same as last year. The balance was a little less, being £9079, compared with £10,405 twelve months ago. One of the most encouraging features on the receipts side was the steady growth in the sales of gas in the Barnsley district. Nearly 9 million c.ft. more gas had been sold. The return from residuals was excellent; the net result being an increase of £2247. The Chairman announced reductions in the price of gas as follows: The future discounts on quarterly accounts up to 100,000 c.ft. would be 5 p.ct.; up to one million c.ft., 10 p.ct.; up to 2 million c.ft., 20 p.ct.; and over 2 millions, 25 p.ct. Slot meter consumers having their own fittings would receive a discount of over 8 p.ct. If the fittings belonged to the Company, they would receive between 4 and 5 p.ct. discount.

Tipton Gas-Stove Explosion.—There was one death as a result of the Tipton explosion on Aug. 21, referred to in last week's "JOURNAL," p. 704. At the inquest on Wednesday last on Alfred Griffin, a verdict of "Accidental death" was returned by Mr. R. Marshall, the Dudley Borough Coroner. The explosion occurred in a coal-gas stove at the works of Messrs. Thomas Dudley (Ltd.), of Dudley Port, Tipton; and in his evidence, Mr. Thomas Dudley, Managing Director, stated that at about 4 p.m. on Aug. 21 he heard an explosion in the blacking shed. He found that the japanning stove had exploded, and that the shed was on fire. There was a quantity of black enamel and turpentine substitute in the shed. His theory as to the cause of the explosion was that when the door was shut, after the stove was lit, it extinguished some of the burners. He thought the flashings from the blacking would start the fire, the blacking being made from boiled linseed oil, and containing very little graphite. In addition, there was the turpentine substitute. The Coroner did not think the cause of the explosion had been satisfactorily explained. It might have been due to some defect in the stove, or to the fumes from the turpentine substitute getting into the stove.

STOCK MARKET REPORT.

THE passing of the month of August, with the usual holiday depression, was a relief to operators on the Stock Exchange. The reparation question brought about a little activity at the beginning of the month; and on the assumption that the matter is at last well on the road to a settlement, a fairly steady front was preserved at the close. The gilt-edged section was a little irregular, with, however, no appreciable changes. The unsettled state of Indian political affairs was not reflected in the price of Government Loans. Home Rails were again quiet; but Foreign Rails, encouraged by the good traffic returns, showed signs of improvement. On Friday, the feature of the day was the renewed strength of Tea Shares, possibly encouraged by the publication of the excellent results of the leading companies.

In the Gas Market there was a slight reaction in the Brentford quotations, both the "A" and the "B" stocks being marked down a point. The feature of the week, however, was the further rise in the Continental Union Stock of 5 points, to 32-37. There was a fair amount of activity in Gas Stocks generally, and it will be seen by the Table that there were numerous quotations marked down for *ex* div.

On the London Stock Exchange during the week, transactions were recorded at the following prices:

On Monday, Brentford "A" 109, "B" 108½, 111, Continental Union 29½, 29⅝, 29½, 30, European 8, Gas Light and Coke 90⅜, 91, 91⅛, 91⅜ *ex* div., 4 p.ct. preference 79½, 79¾ *ex* div., 3 p.ct. debenture 65, Imperial Continental 166, South Metropolitan 98½, 98⅝, 98¾, 99 *ex* div., Tottenham District "B" 100¾, 101½, Wandsworth "C" 98½. Supplementary prices, Aldersbot New "C" 82, 82½, Bournemouth 7 p.ct. debenture 103½, 104, Brentford 7½ p.ct. mortgages 99¼, Peterborough cons. 104.

On Tuesday, Brentford "B" 108, Cape Town 7¼, Continental Union 29⅝, European 8, 8 3/16, Gas Light and Coke 90½, 91⅜ *ex* div., 4 p.ct. preference 79, 80 *ex* div., Imperial Continental 165½, Portsea Island "D" and "E" 7 p.ct. 85, Primitiva 7s., South Metropolitan 99 *ex* div.

On Wednesday, Alliance and Dublin 4 p.ct. debenture 64⅜, Brentford "B" 107, British Gas Light 7 p.ct preference 120, Commercial 4 p.ct. 91, European 8 7/32, Gas Light and Coke 90⅜, 91½, 91⅛ *ex* div., 4 p.ct. preference 80 *ex* div., Imperial Continental 165½, 166, Portsea Island "D" and "E" 7 p.ct. 85½, Primitiva 7s., South Metropolitan 97½, 98¼, 99 *ex* div., 3 p.ct. debenture 60½. Supplementary prices, Pinner 6 p.ct. preference 5 5/16.

On Thursday, Alliance and Dublin 65, British Gas Light 118½, 7 p.ct. preference 121, Continental Union 29½, 30⅛, European, 8 1/16, Gas Light and Coke 91, 91½, 91⅛, 3 p.ct. debenture 60½, Imperial Continental 166, South Metropolitan 98½, 98½, 99¼, South Suburban 5 p.ct. 103½, Swansea 7 p.ct. preference 104⅜ *ex* div., 6½ p.ct. debentnre 103, Tottenham District "B" 100¾. Supplementary prices, Danish 63s. 1½d., Leatherhead 5 p.ct. 11⅛, 11¼.

On Friday, Brentford "A" 107, "B" 107, Brighton and Hove "A" 124½ *ex* div., British Gas Light 118½, Commercial 3½ p.ct. 90, Continental Union 30, 33, 34⅛, 34⅜, 35, Gas Light and Coke 91, 3 p.ct. debenture 61⅛, 61½, Hong Kong and China £16 13s. 3d., £16 14s. 6d., Primitiva 6s. 6d., South Metropolitan 98⅛, 3 p.ct. debenture 60, 61, Swansea 7 p.ct. preference 102⅜ *ex* div. Wandsworth "A" 137, 3 p.ct. debenture 56½. Supplementary prices, Colonial Gas Association 15s. 9d., 7 p.ct. preference 15s. 6d., Southgate and District 4 p.ct. debenture 78, 78½, Worthing 4 p.ct. debenture 70.

Although stringent conditions prevailed in Lombard Street on Tuesday, Wednesday, and Thursday, conditions were more comfortable at the close of the week. Up to 3½ p.ct. was paid for new day-to-day money, easing later to 3–3½ p.ct. The higher rate at which the Treasury Bills were allotted (£3 15s. 1·96d.) gave the discount market a firmer tendency.

The Foreign Exchanges Market was fairly steady; but at the end of the week Allied currencies recovered sharply in response to a good demand on New York account, and the previous week's rate for the dollar-sterling was maintained at $4.50½. French francs finished 1.42 in favour of that country on the week, at 81.90; while Belgian francs also improved against sterling at 89. Italian lire were fairly level at 101 7/16. Dutch florins closed at 11.61½.

The price of silver advanced on the week to 34 7/16d. per oz. on Continental inquiries and absorption for coinage purposes.

The Bank Rate is 4 p.ct., to which it was raised from 3 p.ct. on July 5, 1923. Bankers' deposit rates are 2 p.ct. The deposit rates of the discount houses are 2 p.ct. at call and 2½ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Aug 30.	Rise + or Fall − on Week.	Transaction Lowest and Highest Prices.
£			%p.a.	%p.a.				
131,978	Stk.	Aug. 14	5	5	Aldershot 5 p.c. max. C.	80—83	..	..
235,492	,,	,,	4	4	Do. 4 p.c. Pref.	68—72	..	..
1,551,868	,,	Apr. 3	5½	6	Alliance & Dublin Ord.	63—68	..	65
374,000	,,	July 10	4	4	Do. 4 p.c. Deb.	60—65	..	64½
280,000	5	May 22	8	8	Bombay, Ltd.	5—5½	..	..
100,000	10	Aug. 14	8½	8½	Bournemouth 5 p.c.	12—13	..	..
383,110	10	,,	7	7	Do. B 7 p.c.	11⅝—12⅛	..	..
150,000	10	,,	6	6	Do. " Pref. 6 p.c.	10⅝—11⅛	..	..
50,000	Stk.	June 26	3	3	Do. 3 p.c. Deb.	54—59	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	74—79	..	..
992,045	,,	July 10	6 3/10	6 3/10	Brentford A Con.	107—112	−1	107—109
990,800	,,	,,	6⅝	6⅝	Do. B New	107—112	−1	107—111
76,000	,,	,,	5	5	Do. 5 p.c. Pref.	87—92	..	..
306,690	,,	June 12	4	4	Do. 4 p.c. Deb.	75—80	..	..
181,337	,,	,,	—	6	Do. 6 p.c. Rich. Red. Deb.	100—105	..	..
214,740	,,	Aug. 28	11½	11½	Brighton & Hove Orig.	167—172*	−4	..
244,200	,,	,,	8½	8½	Do. A Ord.	123—126*	−3	124½
1,287,500	,,	July 24	5	5	Bristol 5 p.c. max.	91—92*a	..	..
855,000	,,	Mar. 20	—	7	British Ord.	117—122	..	118½
100,000	,,	June 26	7	7	Do. 7 p.c. Pref.	118—123	..	120—121
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	72—77	..	..
100,000	10	May 22	6	8	Cape Town, Ltd.	6½—7½	..	7½
100,000	10	Apr. 24	4½	4½	Do. 4½ p.c. Pref.	6—7	..	..
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb.	71—76	..	..
626,860	,,	July 24	6	6	Cardiff Con. Ord.	97—100	..	..
237,860	,,	June 26	7½	7½	Do. 7½ p.c. Red. Deb.	103—106	..	..
157,150	,,	Aug. 14	6½	5	Chester 5 p.c. Ord.	86—91*b*	..	..
1,513,280	,,	July 24	6	6	Commercial 4 p.c. Cap.	88—93	..	91
560,000	,,	,,	6	6	Do. 3½ p.c. Cap.	88—93	..	90
475,000	,,	June 12	3	3	Do. 3 p.c. Deb.	56—59	..	..
800,000	,,	14 Jan. 15	—	—	Continental Union, Ltd.	32—37	+5	29½—35
200,000	,,	June 12	7	7	Do. 7 p.c. Pref.	79—84	..	..
660,000	,,	Aug. 28	6½	6½	Croydon sliding scale	99—102*	−2	..
284,975	,,	,,	5	5	Do. max. div.	82—86*	−3	..
492,270	,,	Aug. 28	9	6	Derby Con.	107—110*	−½	..
55,000	,,	July 10	4	4	Do. Deb.	74—76*c*	..	..
209,000	,,	Apr. 3	5	5	East Hull 5 p.c. max.	..	..	..
1,002,180	10	July 24	2	6	European, Ltd.	7½—8½	..	8—8 3/32
16,503,045	Stk.	Aug. 14	10	5½	Gas Light & Coke 4 p.c. Ord.	90—92	..	90½—91¾
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	61—64	..	..
4,062,235	,,	,,	4	4	Do. 4 p.c. Con. Pref.	78—81	..	79—80
4,761,930	,,	June 12	3	3	Do. 3 p.c. Con. Deb.	60—63	..	60—61½
130,000	,,	—	10	10	Do. 10 p.c. Bonds	..	..	..
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	,,	Mar. 20	6½	6½	Hastings & St. L. 5 p.c. Conv.	91—96	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	76—81	..	..
70,000	10	May 8	10	10	Hongkong & China, Ltd.	16—17	..	16/13/3-16/14/6
86,600	Stk.	Aug. 14	10	10	Hornsey 7 p.c.	138—143	..	..
1,976,000	,,	May 22	10	30	Imperial Continental Cap.	165—170	..	16?½—166
263,950	,,	Aug. 14	3½	3½	Do. 3½ p.c. Red. Deb.	68—71	..	..
235,242	,,	Aug. 11	6½	6½	Lea Bridge 5 p.c. Ord.	93—100	..	..
2,127,340	,,	Aug 14	5½	5½	Liverpool 5 p.c. Ord.	89—90*b*	..	..
600,000	,,	Mar. 20	7	7	Do. 7 p.c. Red. Pref.	105—108*b*	+2	..
165,736	,,	Aug. 28	8	9	Maidstone 5 p.c. Cap.	120—125*	−4	..
63,480	,,	June 26	3	3	Do. 3 p.c. Deb.	53—58	..	..
75,000	5	,,	5	7	Malta & Mediterranean	3½—3¾	..	..
541,920	Stk.	June 12	4	4	Montevideo, Ltd.	54—59	..	..
1,875,892	,,	July 24	5½	5	Newcastle & Gateshead Con.	82—83*d*	−½	..
250,166	,,	,,	4	4	Do. 4 p.c. Pref.	74—75*d*	..	..
529,705	,,	June 26	3½	3½	Do. 3½ p.c. Deb.	70—72*d*	..	..
15,000	10	Aug. 28	11	11	North Middlesex 10 p.c.	15½—16½*	−½	..
75,940	10	,,	7 7/10	7 7/10	Do. 7 p.c.	11—11½*	−½	..
300,000	Stk.	May 8	9	7	Oriental, Ltd.	98—101	..	..
138,120	,,	June 26	7 5/8	7½	Plym'th & Ston'house 5 p.c.	112—117	..	..
60,000	50	Aug. 28	13	13	Portsea Island B	99—102*	−3	..
100,000	50	,,	12	12	Do. C	95—100*	−3	..
2,289,909	1	—	—	—	Primitiva Ord.	¼—½	..	6/6—7/-
341,400	100	June 2	4	4	Do. 4 p.c. Red. Deb.	75—78	..	..
600,000	Stk.	July 24	4	4	Do. 4 p.c. Red. Deb. 1911	53—56	..	..
220,335	,,	June 26	4	4	Do. B. Aires 4 p.c. Rd. Db.	54—57	..	..
321,670	,,	,,	4	4	Do. R'r P'te 4 p.c. Rd. Db.	54—57	..	..
150,000	10	Mar. 20	6	6	San Paulo 6 p.c. Pref.	7—7½	..	..
125,000	50	July 1	5	5	Do. 5 p.c. Red. Deb.	41—43	..	..
270,000	Stk.	Mar. 20	5/8/4	5½	Sheffield A	99—101*e*	..	..
419,968	,,	,,	5/8/4	5½	Do. B	99—101*e*	..	..
1,047,000	,,	,,	5/8/4	5½	Do. C	99—101*e*	..	..
90,000	10	June 12	6	8	South African	7—9	..	..
6,609,895	Stk.	Aug. 14	6½	5	South Met. Ord.	97—99	..	97½—99½
102,580	,,	July 10	5	5	Do. Red Pref.	96—98	..	..
1,895,445	,,	,,	3	3	Do. 3 p.c. Deb.	59—62	+1	60—61
734,000	,,	Mar. 6	6½	6½	Do. 6½ p.c. Red. Deb.	103—105	..	..
91,500	,,	Aug. 28	8½	8½	South Shields Con.	133—135*d*	−3	..
1,087,795	,,	Aug. 14	6½	6½	South Suburban Ord. 5 p.c.	102—105	−1	103½
368,837	,,	June 26	5	5	Do. 5 p.c. Deb.	93—98	..	..
647,740	,,	May 8	6	5	South'mpt'n Ord. 5 p.c. max.	85—88	..	..
121,275	,,	June 26	4	4	Do. 4 p.c. Deb.	73—78	..	..
250,000	,,	Aug. 28	7	7	Swansea 7 p.c. Red. Pref.	101½—103½*	−2½	102½—104½
200,000	,,	June 26	6½	6½	Do. 6½ p.c. Red. Deb.	102—104	..	103
120,000	,,	July 24	8	8	Tottenham District A 5 p.c.	116—119	..	..
882,275	,,	,,	6½	6½	Do. B 3½ p.c.	99—102	..	100½—101½
181,255	,,	June 12	4	4	Do. 4 p.c. Deb.	76—80	..	..
258,251	,,	Mar. 20	5	7/14/4	Tynemouth Con. and New Wandsworth, Wimbledon, and Epsom—	86—88	+½	..
30,000	,,	July 10	9½	9½	Wandsworth A 5 p.c.	132—137	..	137
255,636	,,	,,	7½	7½	Do. B 3½ p.c.	113—118	..	..
108,075	,,	,,	6/7/9	6/9/6	Do. C	96—101	..	98½
240,865	,,	,,	6/7/9	6/9/6	New Ordinary	..	..	..
352,000	,,	,,	7½	7½	Wimbledon 5 p.ct.	110—115	..	..
98,000	,,	,,	7½	7½	Epsom 5 p.ct.	115—120	..	..
88,416	,,	June 26	3	3	3 p.c. Deb.	55—60	..	56½

Quotations at:—*a.*—Bristol, *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. * Ex. div;

GASHOLDER AND TANK CONSTRUCTION AT THE SUTTON GAS-WORKS.

1,000,000 cubic feet capacity.

By F. SOUTHWELL CRIPPS.

Price 10/6 net.

WALTER KING, LTD., "GAS JOURNAL" OFFICES

No. 11, Bolt Court, FLEET STREET, E.C. 4.

Irish Gas Troubles.—Tralee gas supply was suspended for three weeks as the result of a strike of gas workers, who went out in sympathy with carters who had struck. The men intimated that they were prepared to return if paid one week's wages of the three, and the Urban Council agreed to this in the interests of the consumers. At the same time, however, they held that there was no justification for the strike. Gas workers in Nenagh have struck on a proposal to reduce wages by 10s.

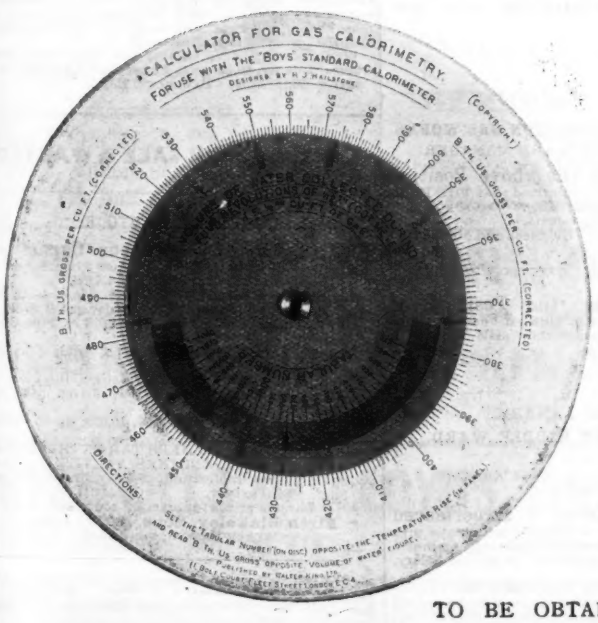
Woking District Gas Company.—There was an increase of practically 9 p.ct. in the quantity of gas sold by the Company during the six months ended June 30, as compared with the corresponding period of the previous year, and at the meeting next Monday a dividend for the half-year (less income-tax) will be proposed at the rate per annum of 6 p.ct. on the "A" and "B" ordinary stocks. This, and the payment of the dividends on the preference stocks, will leave £3183 to be carried forward to the next account. At the last annual meeting, the late Chairman (Mr. Samuel Spencer) resigned his seat on the Board, owing to advancing years; and in their report the Directors express their regret at his subsequent decease. Mr. Lawrie Trewby was appointed to fill the vacancy on the Board, and was subsequently elected Chairman and Managing Director. They place on record their appreciation of Mr. Spencer's services to the Company, extending over a period of more than thirty years. They also announce with sorrow the death of the Consulting Engineer, Mr. A. F. Phillips, who had been connected with the Company for a number of years.

Forthcoming Gas Exhibition at Accrington.—At a meeting of the Accrington and District Gas Board on Aug. 28, the Manager (Mr. A. J. Harrison) reported on arrangements made for a gas exhibition in Wesley School from Sept. 22 to 27 inclusive. In connection with the exhibition, cookery lectures would be given, and these had been arranged for Church, Clayton-le-Moors, Rishton, and Great Harwood. Altogether there would be 32 lectures, split-up over the whole district. On Sept. 23, Dr. Saleeby would speak in the Town Hall on "Light and Life." In conjunction with the exhibition there would be a display of smoke abatement and industrial appliances.

Relief of Unemployment at Oswaldtwistle.—At a meeting of the Oswaldtwistle Council on Aug. 28, Mr. J. H. Davies, Gas Manager, said they had commenced an extension scheme to alleviate temporarily some of the unemployment. The Council had hoped to give every unemployed man in the district some help; but many men had been sent to him without any reference to their ability to do the work, and some were unemployable for this class of labour. After the first eight weeks, labour costs were analyzed, and it was found that the scheme was costing double what it should have done. The Council had therefore found it necessary to select men with some knowledge of the work.

The Chapeltown Council will shortly commence their scheme to light the district with nearly 200 gas lamps. Contracts for these have been given out locally, and arrangements have been made with the Sheffield Gas Company to supply the gas.

CALCULATOR FOR GAS CALORIMETRY


CALCULATOR FOR GAS CALORIMETRY
FOR USE WITH THE 'BOYS' STANDARD CALORIMETER
DESIGNED BY H. J. HAILSTONE
(COPYRIGHT)
B.TH.U. GROSS PER CU. FT. (CORRECTED)
DIRECTIONS

Designed by Mr. H. J. HAILSTONE, of the Rochdale Corporation Gas Department.

Invaluable to GAS EXAMINERS under the Gas Regulation Act and all employed in WORKS TESTING

(See Article in "JOURNAL," May 21, p. 523.)

The Calculator consists of a Well-finished Metal Plate, about 7½ in. in diameter, in the centre of which is a Celluloid Rotating Disc.

The Scales are clear and well spaced, and are specially arranged so as to avoid any reversed readings.

The Range is sufficient to include any results obtained with the "Boys" Calorimeter with Gases of 350 to 600 B.Th.U. gross.

Price, Post free, 12/6

TO BE OBTAINED FROM

WALTER KING, LTD., "GAS JOURNAL" Offices, 11, Bolt Court, Fleet Street, London, E.C. 4.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer—not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON TUESDAY, to ensure insertion in the following day's issue.

Orders to Alter or Stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Monday.

UNDISPLAYED ADVERTISEMENTS; Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum, 4s. 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

		ONE YEAR.	HALF-YEAR.	QUARTER.
United Kingdom	Advance Rate:	35/-	18/-	10/-
	Credit Rate:	40/-	21/-	11/6
Dominions & Colonies & U.S.A. Payable in Advance		35/-	—	—
Other Countries in the Postal Union, Payable in Advance		40/-	22/6	12/6

In payment of subscriptions for "JOURNALS" sent abroad, Post Office Orders or Bankers' Drafts on London only are accepted.

All Communications, Remittances, &c., to be addressed to WALTER KING, LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C. 4.

Telegrams "GASKING, FLEET LONDON." Telephone: Central 6055.

OXIDE OF IRON

FOR SALE OUTRIGHT, OR ON LOAN.

SPENT OXIDE

PURCHASED IN ANY DISTRICT.

GAS PURIFICATION & CHEMICAL CO., LTD.,
PALMERSTON HOUSE,
OLD BROAD STREET, LONDON, E.C.2.

"VOLCANIC" FIRE CEMENT.
Resists 4500° Fahr. Best for Gas-Works.
ANDREW STEPHENSON, Gresham House, Old Broad Street, LONDON, E.C. "Volcanism, London."

SULPHATE OF AMMONIA
SATURATORS and all LEAD and TIMBER WORK in connection with Sulphate Plants.
We Guarantee promptness with efficiency for Repairs.
JOSEPH TAYLOR (SATURATORS), LTD., Chemical Plant Engineers, Blackhorse Street Mills, BOLTON.
Telegrams—"SATURATORS, BOLTON." Telephone 848.

"LUX" PURIFYING MATERIAL.

THE PREMIER MATERIAL FOR GAS PURIFICATION.

THOS. DUXBURY AND CO.,
SOLE AGENTS FOR
ENGLAND, SCOTLAND, IRELAND, WALES AND THE COLONIES (except CANADA).

16, DEANSGATE, MANCHESTER.
Telegrams: Darwinian, Manchester." *Tel. Nos.:* 3268-9 City.

PALACE CHAMBERS, WESTMINSTER, S.W.1.
Telegrams: "Darwinian, Parl, London." *Tel. No.:* 6373 Victoria.

SPENCER'S Patent Inclined HURDLE GRIDS.

THE very best Patent Grids for Holding Oxide Lightly.
See Illustrated Advertisement, July 9, p. 274.

SULPHURIC ACID.

SPECIALLY prepared for the manufacture of SULPHATE OF AMMONIA.
SPENCER CHAPMAN & MESSEL, LTD.,
with which is amalgamated WM. PEARCE & SONS, LTD., 86, Mark Lane, LONDON, E.C. Works—SILVERTOWN.
Telegrams—"HYDROCHLORIC, FEN, LONDON."
Telephone—ROYAL 1166.

GEORGE WILSON GAS METERS, Ltd.
for
GAS-METERS, ORDINARIES, SLOTS, AND REPAIRS.
Foleshill Road, COVENTRY.
Telephone: 596. Telegrams: "GASMETER,"
and at 268, Stockport Road, MANCHESTER.
Telephone: RUSHOLME 976. Telegrams: "GASMETER,"
and 46 & 47, Auckland Street, LONDON, S.E. 11.
Telephone: HOP 647. Telegrams: "GASEOUS LAMB."

MEWBURN, ELLIS, & CO.,
CHARTERED PATENT AGENTS AND TRADE MARK AGENTS,
70 & 72, Chancery Lane, London, W.C.2.
Telegrams: "Patent, London." Phone 243 Holborn.
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

J. E. C. LORD (Manchester), Ltd., Ship Canal Tar Works, Weaste, Manchester. Pitch, Creosote, Benzols, Toluol, Naphtha, Pyridine, all kinds of Cresylic Acid, Carbolic Acid, &c.

WE Specialize in Small Gas-Works and Solicit Inquiries for COMPLETE WORKS EXTENSIONS, and RENEWALS.
Penney & Porter (Engineers), Ltd.,
LINCOLN.
Established 1855.
Telegrams: Porter, Lincoln. Telephones: 266 & 211.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E. 1.
WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.
REPAIRS RECEIVE PROMPT ATTENTION.
Telephones: 815, Oldham, and 2412 Hop, London.
Telegrams—
"BRADDOCK, OLDHAM," and "METRIQUE, LAMB, LONDON."

BRITISH GAS PURIFYING MATERIAL.

ALSO BEST QUALITY DUTCH AND BELGIAN BOG ORE.
SPENT OXIDE PURCHASED.

BRITISH GAS PURIFYING MATERIALS CO., LTD.,
Note change of address:—
Head Office: 99, LONDON ROAD, LEICESTER.
North of England Representative:
MATT. DUNN, M.I.Mech.E., MANSION HOUSE CHAMBERS, NEWCASTLE-ON-TYNE.
Representative for Scotland:
CHAS. FERNS, 147, BATH STREET, GLASGOW.

APPOINTMENTS, &c., VACANT.

WHEN Filling Vacancies, please REMEMBER THE CLAIM OF THE EX-SERVICE MAN, who, other Qualifications being equal, has the FIRST CALL ON YOUR CONSIDERATION.

MACCLESFIELD CORPORATION GAS-WORKS.
ASSISTANT ENGINEER AND MANAGER.

APPLICANTS for the above Position are THANKED, and informed that THE POSITION HAS NOW BEEN FILLED.
H. CURTIS,
Engineer and Manager.

APPLICANTS for the Position of Inspector-Canvasser, advertised under No. 7450 are THANKED and Informed that THE VACANCY HAS NOW BEEN FILLED.

COUNTY OF LANARK.
DISTRICT OF THE MIDDLE WARD.

BOTHWELL AND UDDINGSTON GAS UNDERTAKING.

ASSISTANT Wanted — Experienced Chemist. Must be thoroughly conversant with Carbonization, Vertical Retorts, Sulphate of Ammonia Manufacture, and Tar Distillation. Minimum Salary, £350.
Applications, stating Age, Experience, &c., and accompanied by *copies* of Testimonials, must be lodged with the Subscriber not later than the 10th of September.
W. E. WHYTE,
District Clerk.
Hamilton,
Aug. 28, 1924.

GUERNSEY GAS LIGHT COMPANY, LIMITED, CHANNEL ISLANDS.

TO GAS ENGINEERS AND MANAGERS.

WANTED—A Gentleman fully qualified and Experienced to take (under the direction of the Manager and during his absence) the Entire Charge of the Company's Works (about 180 Millions)—Distribution and Secretarial Duties; capable of Planning and Carrying out all Additions, Extensions, Alterations, and Improvements to Works and Distribution Plant.
He must be a Member or Associate Member of the Institution of Gas Engineers, or other recognized Institution of a like nature; produce exceptional References, be prepared to devote the Whole of his Time and Abilities to the Interests and Progress of the Company.
Salary £400 per Annum, with prospects.
Apply, stating Age, Training, Experience, and *copies* (non-returnable) of not more than three Testimonials.
F. H. ARNOLD,
Manager.
Registered Office,
Smith Street,
Guernsey,
Channel Islands,
Aug. 27, 1924.

OXIDE OF IRON.
SPENT OXIDE BOUGHT.

BALE & CHURCH, LTD.
33, ST. MARY AT HILL, LONDON, E.C.3.
Phone: Royal 1484.

"TORTO" FIRE CEMENT.

BALE & CHURCH, LTD.
33, ST. MARY AT HILL, LONDON, E.C.3.
Phone: Royal 1484.

"KLEENOFF," THE COOKER CLEANSER.
Tins for Sale to Consumers.
In Bulk for Works Use.
(*See p.* 156 "*Gas Salesman.*")

BALE & CHURCH, LTD.,
33, ST. MARY AT HILL, LONDON, E.C.3.
Phone: Royal 1484.

BUCKHAVEN AND LEVEN GAS COMMISSIONERS.

DRAUGHTSMAN wanted with Experience in Gas-Works Construction—to assist Engineer with Works and Distribution Extensions.
Apply, with *copies* of Testimonials, and state Salary, to H. A. AITKEN, Engineer and Manager, GAS-WORKS, LEVEN, FIFE.

FIRST-CLASS Draughtsman Wanted by Contractors in the North of England, thoroughly acquainted with Gas Works Apparatus and Chemical Plant. None but Experienced men need apply.
State Wages required and when at liberty to R. & J. DEMPSTER, LTD., MANCHESTER.

WANTED—Qualified Gas and Mechanical ENGINEER FOR OIL WORKS in ESTHONIA. Applicants must have had good Experience in Gas Carbonizing and Bye-Product Work or Coke-Oven and Bye-Product Work, and be Capable of Controlling men. The position would be a progressive one to the right man with the necessary abilities. A man having experience in Shale Oil Production and Distillation would be considered.
Write, stating Age, Salary, and Experience, and when at Liberty, to Box 853, FROST-SMITH ADVERTISING SERVICE, 66, FINSBURY PAVEMENT, E.C. 2.

PLANT, &c., FOR SALE & WANTED.

GAS PLANT IN STOCK.

GASHOLDERS.—Various Capacities in Stock up to 500,000 c.ft. Low Prices for erection complete, with STEEL TANKS.
Condensers.—Annulars: Sets of 3 and 4, 12 in. Connections. Water Tube Condensers (½ million c.ft.), 14 in. Connections, 6 in. and 8 in. Pipe Condensers.
Tower Scrubbers.—4½ by 36, 4 by 24, 4½ by 18, 4 by 12, 3 by 12.
Purifiers.—Sets 25 ft. sq., 10 ft. sq., 10 ft. by 8 ft.
Exhausters.—Steam and Belt driven, 2000 to 50,000 c.ft. capacity.
Station Meters.—3000, 5000, 15,000, up to 63,000 c.ft. capacity.
Also a good stock of WASHERS, TAR EXTRACTORS, TANKS, PUMPS, ENGINES, VALVES, &c. Detailed List on Application. Really First-Class Gas Plant, equal to new.
Bargain prices for erection complete.
Firth Blakeley, Sons, & Co., Ltd.,
CHURCH-FENTON, *via* LEEDS.

STEAM-BOILERS For Sale—All Sizes, Vertical, Loco-type, Cornish, Portable, and Other Types of Boilers.
Apply GRANTHAM BOILER & CRANK CO., LTD., GRANTHAM.

FOR DISPOSAL.—One Set of Four C. I. Luteless PURIFIERS, 20 ft. square, with Weck Centre Valve and Connections, complete with Travelling Lifting Crane, all by R. & J. Dempster. New 1906.
Apply to the ENGINEER, REDDITCH GAS COMPANY.

STATION METER, replaced by larger, ON SALE. 15,000 cubic feet per hour, rectangular case.
Apply to the MANAGER, GAS WORKS, LEYLAND.

FOR SALE—Small Gas-Works as going Concern. Pleasantly Situated in Lower Midlands.
Address, No. 7459, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

"GAS JOURNALS" required, in good condition, for November 12, 1918, and January 28, 1919.
Quote best price to No. 7460, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.